REPORT RESUMES

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TRADE AND INDUSTRIAL TEACHER EDUCATION, REPORT OF A NATIONAL INVITATIONAL RESEARCH PLANNING CONFERENCE (OHIO STATE UNIVERSITY, MAY 23-27, 1966).

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NATIONAL LEADERS WERE BROUGHT TOGETHER TO FOCUS THEIR ATTENTION ON THE GENERATION OF GUIDELINES FOR RESEARCH AND DEVELOPMENT PROGRAMS TO EXPAND AND IMPROVE TRADE AND INDUSTRIAL TEACHER EDUCATION. TO PROVIDE BACKGROUND INFORMATION AND TO STIMULATE THINKING, SEVERAL PAPERS WERE COMMISSIONED AND PRESENTED. THESE PAPERS INCLUDED--(1) "A REVIEW OF RESEARCH IN TRADE AND INDUSTRIAL TEACHER EDUCATION," (2) "REPORT OF ANALYSIS OF SOURCES OF TRADE AND INDUSTRIAL TEACHERS," (3) "ANALYSIS OF TRADE AND INDUSTRIAL TEACHER EDUCATION PROFESSIONAL LITERATURE," (4) "DEVELOPMENT OF TECHNICAL TRAINING, TEACHER TRAINING, AND SCHOOL ADMINISTRATION PROCEDURES IN THE U.S. NAVY," (5) "TELEVISION RECORDINGS--A NEW DIMENSION IN TEACHER EDUCATION," (6) "A CURSORY STUDY OF INNOVATIONS IN TRADE-TECHNICAL TEACHER EDUCATION IN THE UNITED STATES," (7) "IMPLICATIONS OF COMPUTERIZED INSTRUCTION," (8) "THE DEVELOPMENT OF TRAINING LESSONS FOR PRE-SERVICE AND INITIAL-IN-SERVICE VOCATIONAL TEACHER EDUCATION RECORDED AND PRESENTED THROUGH VIDEO TAPE AND TELEVISION WITH SEMINAR SESSIONS," AND (10) "PROJECTIONS FOR TRADE AND INDUSTRIAL TEACHER EDUCATION." (EM)

VT 01425

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REPORT OF

A National Invitational
RESEARCH PLANNING CONFERENCE

Trade and Industrial Teacher Education

THE CENTER FOR VOCATIONAL AND TECHNICAL EDUCATION
THE OHIO STATE UNIVERSITY / 980 KINNEAR RD./ COLUMBUS , OHIO 43212

VT 01425

The Center for Vocational and Technical Education has been established as an independent unit on The Ohio State University campus with a grant from the Division of Adult and Vocational Research, U. S. Office of Education. It serves a catalytic role in establishing a consortium to focus on relevant problems in vocational and technical education. The Center is comprehensive in its commitment and responsibility, multidisciplinary in its approach, and interinstitutional in its program.

The major objectives of The Center follow:

1. To provide continuing reappraisal of the role and function of vocational and technical education in our democratic society;
2. To stimulate and strengthen state, regional, and national programs of applied research and development directed toward the solution of pressing problems in vocational and technical education;
3. To encourage the development of research to improve vocational and technical education in institutions of higher education and other appropriate settings;
4. To conduct research studies directed toward the development of new knowledge and new applications of existing knowledge in vocational and technical education;
5. To upgrade vocational education leadership (state supervisors, teacher educators, research specialists, and others) through an advanced study and in-service education program;
6. To provide a national information retrieval, storage, and dissemination system for vocational and technical education linked with the Educational Research Information Center located in the U. S. Office of Education;
7. To provide educational opportunities for individuals contemplating foreign assignments and for leaders from other countries responsible for leadership in vocational and technical education.

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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REPORT
OF
A NATIONAL INVITATIONAL RESEARCH PLANNING CONFERENCE ON TRADE AND INDUSTRIAL TEACHER EDUCATION

May 23-27, 1966

THE CENTER FOR RESEARCH AND LEADERSHIP
DEVELOPMENT IN VOCATIONAL AND
TECHNICAL EDUCATION

The Ohio State University
Columbus, Ohio

THE WORK PRESENTED OR REPORTED HEREIN WAS PERFORMED PURSUANT TO A GRANT FROM THE U.S. OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION AND WELFARE.

PREFACE

The National Invitational Research Planning Conference on Trade and Industrial Teacher Education was sponsored by The Center for Research and Leadership Development in Vocational and Technical Education, The Ohio State University, to stimulate interest and effort in trade and industrial teacher education research and development. Specifically, the conference planning committee sought to bring together several national leaders in T. and I. teacher education and related areas to focus attention on the generation of guidelines for research and development programs to expand and improve T. and I. teacher education. The challenge that inspired this conference was the need to provide teachers to serve an increasing number of trade and industrial education programs throughout the nation.

To provide needed background for the conference, and to stimulate thinking, several papers were commissioned and presented to help conferees review the present status and project teacher education programs in this professional area. We are greatly indebted to the individuals whose presentations are contained in this publication. We are, also, grateful to the conference participants who labored enthusiastically in identifying future research and action programs, and especially to James R. D. Eddy, Dean of the Division of Extension, University of Texas, for his masterful leadership of this discussion.

Recognition is due the members of the planning committee who provided the suggestions for establishing the basic structure of the conference.

A special tribute goes to Dr. Calvin J. Cotrell who served as conference chairman and was responsible for the preparation of this report. Dr. Cotrell wishes to recognize the efforts of David Larimore, Research Associate, and Betty Diehl, Secretary, for assistance in the preparation of this report.

We trust that this report will be of assistance to others in the profession by encouraging them to engage in needed research and leadership development in trade and industrial teacher education. Further, we hope that the papers and other items included herein will stimulate further discussion and refinements as the profession moves ahead in this vital area.

Robert E. Taylor
Director

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PURPOSE OF THE CONFERENCE

The purpose of the conference was to stimulate interest and joint state and institutional efforts in trade and industrial teacher education research and development.

OBJECTIVES OF THE CONFERENCE

The specific objectives of the conference were:

1. To review previous research in T. and I. teacher education.
2. To review and analyze the professional literature for T. and I. teacher education.
3. To review innovations in general teacher education.
4. To review innovative programs and practices in T. and I. teacher education.
5. To review trade and technical teacher education in the military service.
6. To consider projections for T. and I. teacher education.
7. To develop guidelines for the improvement and expansion of T. and I. teacher education.
8. To identify research and development programs needed to improve and expand T. and I. teacher education.

CONFERENCE PLANNING COMMITTEE

Calvin J. Cotrell	Committee Co-chairman and Specialist in Trade and Industrial Education The Center for Research and Leadership Development in Vocational and Technical Education, The Ohio State University Columbus, Ohio
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PART I

INTRODUCTION

Editor's Note: Some of the papers presented in this report were prepared from tape recordings and are, therefore, subject to transcription error.

SUMMARY OF REMARKS
by
Merle E. Strong*

May I commend Dr. Taylor, Calvin Cotrell, and others associated with organizing this meeting. For some time, we in the Office, have seen a need to have an experienced group of leaders in trade and industrial teacher education brought together to share experiences and best thinking on where we should be heading in trade and industrial teacher education. The conference should provide the opportunity to share information on new practices, to become acquainted with research in the area, to react to new proposals or methods, to develop guidelines for expansion and improvement of teacher education programs, and last but not least, to suggest research or pilot programs that should be implemented. This group has been selected not only because you are experienced and are leaders in the field, but also because you are among the innovators.

We are greatly concerned in the Office about the means by which adequate numbers of teachers will be provided and about the problem of upgrading present teachers.

I am sure that this session will be fruitful in providing some of the answers needed.

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*Dr. Strong is Assistant Director, Program Services Branch, Division of Vocational and Technical Education, U. S. Office of Education, Department of Health, Education, and Welfare, Washington, D. C.

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PART II

REVIEW OF THE STATUS

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A REVIEW OF RESEARCH
IN TRADE AND INDUSTRIAL TEACHER EDUCATION

by

John L. O'Brian and Carl J. Schaefer[1]

This paper relates to a body of knowledge, represented by studies, writings, and reports, targeting on trade and industrial teacher education. The task of reviewing the conglomerated materials was complicated by their diversity in both definition and scope. So there will be no mistake about it, the report herein is limited to the discreet definition of trade and industrial education which is found in the American Vocational Association publication on definitions and states:

> . . . instruction which is planned to develop basic manipulative skills, safety judgment, technical knowledge, and related occupational information for the purpose of fitting persons for initial employment in industrial occupations and upgrading or retraining workers employed in industry.

The obvious dearth of actual studies (as evidenced by this review) necessitated delving into philosophical writings and reports. These latter categories, although not of research sophistication, provide a rationale of some import to the total picture of trade and industrial teacher education.

Admittedly, the review of literature has been broad, but even so, many relevant pieces probably have been omitted. The materials that were reviewed have been gathered from researchers themselves, library review, reports, and writings. In addition, credit should be given to Jerome Moss, Jr. (1965), who by virtue of his review of research in the winter issue of the Journal of Industrial Teacher Education, made significant contributions to this report both in style and content.

The review has been organized in the following categories for ease of reference and discussion: Recruitment; The Philosophy of Teacher Education; Teacher Competencies; Program Organization; In-Service Offerings; and The Picture.

Recruitment

There have been few attempts to study the problem of T. and I. teacher recruitment. Typically, the problem has been taken for granted. In his outstanding treatise, Man, Education and Work, Venn (1964) discussed the need for vocational and technical teachers. He states unequivocally that:

> One of the greatest handicaps to the improvement and expansion of vocational and technical education is the desperate shortage of qualified teachers and administrators.

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[1] Dr. O'Brian is Associate Professor of Education, and Dr. Schaefer is Professor of Education and Chairman, Department of Vocational-Technical Education, Graduate School of Education, Rutgers - The State University.

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> Except in vocational agriculture and home economics, there is a noticeable lack of teacher preparation and in-service training programs and also difficulty in recruiting well educated individuals with competency in a relevant occupational skill . . . . The kind of teacher preparation program needed for many vocational and technical programs has never been resolved . . . . For too long the educational community has misunderstood the nature of vocational and technical education; there is much more to it than the acquisition of certain skills through the duplication of work activities. Ultimately, vocational and technical education will be as good as those who teach it, and the preparation and continuing updating of teachers for it must become the responsibility of the colleges and universities with experience in teacher education and schools and departments in the relevant disciplines.

More specifically, Vezzani (1965) feels that the vocational teacher is the forgotten individual in our recent legislation pertaining to the preparation of persons for the world of work. Yet the success or failure of programs will depend to a large degree on teachers. He wants to know why those responsible for the Vocational Act of 1963 have failed to provide scholarship grants for the training or upgrading of teachers as was done for the science teachers, guidance counselors, and special education teachers. Schaefer (1963) has referred to the dilemma of recruiting competent T. and I. teachers. He states that we are using solutions based on yesterday's technology while we need a recruiting policy based on today's technology and today's needs. Giachino (1961) attacks the problem of selection by suggesting that there is a need for more realistic procedures available to administrators who must select new trade and industrial teachers. Teachers are often chosen by personal judgment as the exclusive dominating selection factor. There must be some form of relative measurement. In this respect, Giachino has composed a rating form to record the personal interview with the candidate; examination of applicant's scholastic record; administering standardized tests; and evaluating his physical qualities, mental equipment, habits of work, and emotional qualities.

The Office of Education (1966), in reporting on the manpower training program, points out that the initial cadre of teachers for the program came from the ranks of regular vocational education teachers, but just as the regular vocational education facilities became inadequate to hold the expanding volume of manpower trainees, so did the core of regular vocational education teachers. Therefore, they have been recruited by various means, among them the local employment service, universities which offer vocational-technical teacher training, newspaper advertising, and personal contacts in the education and business communities. Business and trade union groups as well as local advisory committees have also assisted.

Nor was the dialogue of recruitment ignored over a decade ago when the Educational Policies Commission (1956) suggested sources of recruitment for teachers. The Commission suggested that married women, retirees, qualified persons from minority groups, and new groups of immigrants be considered. Moreover, in their discussion of manpower and education, the Commission recognized the need for extensive in-service training of teachers when recruited from these reservoirs of talent.

It must be admitted at this point that hard-type studies targeting on the recruitment problem have been almost totally ignored. Mellman's (1957) study in this respect stands as a bench mark.

It was the purpose of the Mellman Study to suggest a more effective T. and I. teacher recruitment program to encourage skilled tradesmen to enter vocational teacher training classes. Among other things, he found out by means of a questionnaire rated by teachers, administrators, and teacher-training personnel that teacher recruitment should begin with recruitment of able students into the vocational high school programs. The following ten steps were given as constituting an appropriate teacher recruiting program based on this philosophy. Trade and industrial teachers should: 1) visit junior high schools and explain their particular trade or related subject to ninth grade students; 2) should tell their students of the opportunities found in teaching vocational subjects; 3) should recommend the field to their better students; 4) should assist their students in locating jobs; 5) should encourage them to return to their teachers for help in solving problems; 6) should, in cooperation with the director or coordinator, maintain contact with their graduates through a yearly follow-up; 7) should maintain good relations with industry through personal visitations and helpfulness; 8) should encourage skilled tradesmen from industry to enter vocational teacher-training schools; 9) should belong to the local vocational and industrial arts teachers' association; and 10) should promote a "career day" where representatives from industry explain the requirements of their vocations. Moreover, it was concluded that: 1) teachers recognize the importance of recruitment practices but have demonstrated a negative professional attitude in their failure to accept many of the responsibilities outlined in the study; 2) it is possible to predict the teacher supply and demand, but the complete cooperation of all personnel is the first requisite for accurate predictions; and 3) the certification requirements for teachers of vocational trade subjects are believed to be adequate by the (Pennsylvania) personnel. It was recommended that the teacher recruitment practices outlined in the study should be used by the teachers and administrators in every local and vocational program; and that brochures, sound moving picture, slides and filmstrips should be prepared on the subject of vocational trade and industrial teaching for use in the guidance programs of the senior high schools.

Philosophy of Teacher Education

The rhetoric dealing with the philosophy of trade and industrial education has adorned the professional journals over the years. Barlow (1958) traced the history of trade and industrial teacher education conferences and cites that the National Society for the Promotion of Industrial Education published a document in May of 1913 pointing up the problem. A revised edition was published following the passage of the Smith-Hughes Act, and the archives of the United States contain a record of the discussions conducted by the Federal Board for Vocational Education in 1917. In May, 1918, the National Society for Vocational Education published Bulletin No. 26 which outlined the problems of administering the Act. The first National Conference on Trade and Industrial Education was held in Minneapolis in 1921, and a second conference of note was held at Blueridge, North Carolina, in August, 1928. A third conference in Minneapolis in 1936 devoted much time to teacher education. Barlow felt that the 1958 Conference on teacher training would be a milestone in the progress of T. and I. teacher education. Wheeler (1958), in summarizing the conference, drew two general conclusions: 1) our foundations are sound, and the main body of industrial teacher education is good. Therefore, the approach is not one of making the bad good, but rather one of making the good better; and 2) the fact that teacher trainers themselves express some dissatisfaction indicates that they are educators in the finer sense. The desire for progress and improvement is always a compelling motive of such individuals; dissatisfaction with the status quo is characteristic. More specifically, Wheeler stated that there are some areas that will need the combined efforts of all. These include: 1) the selection of individuals for teacher training (pre-service); 2) the determination of the nature of the in-service needs of teachers and the order in which the training is needed; 3) teacher-training programs for teachers of trade and extension classes and short-unit Type C programs; 4) realistic certification requirements for teachers based on sound evaluative criteria; 5) the problems of teacher training posed by new trades and technical subjects; and 6) the effect of the increasing technical nature of trades on qualifications of teachers (trade experience, professional training, and technical knowledge). He further raised the question of, "What will the States do about it?" In answering his own question, these points were made: 1) we are looking to the Office of Education for leadership; 2) we are accepting our assigned responsibility; 3) each state will study its present teacher training program, first for improvements, second for change in structure; and 4) provisions for teacher training in new state plans will be more flexible.

At this moment in history, however, it should be quite clear (and I am not sure that it is) that there must be a difference between teacher preparation for trade and industrial education and for industrial arts. Conant (1959) in his study, The American High School Today, recognizes the indecisiveness between the two programs at the operational level which is naturally reflected in teacher preparation, when he states, "The line between the industrial arts program and the vocational shop program (trade and industrial)[2] for boys is not an easy one to draw."

An early philosophical debate, but one which must be mentioned in any review of the literature, took place in the 1950's. As a result of an experiment, Vezzani (1953) advocated among other things, that T. and I. teachers may not need to be tradesmen in the truest sense of the word. By careful screening (using performance exams, as well as oral and written exams) and subsequent follow-up of teachers thus selected, he found and contended that trade experience of X number of years might not itself assure trade competency. The challenge to this notion was quickly picked up by Leighbody (1954) who argued that both the Smith-Hughes Act and the 1948 edition of Bulletin No. 1 mandated that teacher education be reserved for ". . . persons who have had adequate vocational experience in the line of work for which they are preparing themselves or who are acquiring such experience." Diamond (1954) brought an end to this dialogue by relating:

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[2] Author's insert.

> . . . there is the tendency on the part of some to take issue with an author to read into his article implications which have no place in his thinking, and which, by no stretch of the imagination appear in the text . . . . Nowhere in Bulletin No. 1 can we find that adequate experience or practical work experience must be obtained through a specified number of years in the trade. The problem is to select those who can qualify as being occupationally competent. Vezzani suggests that this be done by means of appropriate tests. Can you suggest a better way?

Feirer (1961), in a discussion of "content or method" also raised the question of whether or not in educating industrial teachers, the stress should be on what is taught or how to teach. He feels that the real answer lies in some middle ground between content and method, for both are important. In industrial education, a teacher must know not only how to perform the skills and how to present the information, but he must also have a thorough grasp of methodology before he can teach someone else.

Certification requirements lend to the philosophical framework, as stated by Barlow (1958):

> Teacher training and certification are elements in the same series and should not be considered as entirely separate entities. States which have the most effective teacher training programs have recognized the interdependent relationships of teacher training and certification and have provided for these relationships appropriately.

The National Society for the Promotion of Industrial Education appointed a committee on certification and training of teachers in 1913. The Committee agreed on the following six major items which even today have some validity: 1) the purpose of state certification is to select persons who possess considerable minimum qualifications; 2) certification attests to the general fitness of the candidates to teach their special subject or subjects; 3) control of certification should be in the hands of the state, and advisory committees of labor and management should assist the state in formulating standards; 4) examinations should be conducted by experienced agents of the state who have some responsibility for supervision of industrial schools; 5) the personal interview is an indispensable device for testing personal and teaching qualifications; and 6) if the cost of certification is greater under this method, it should be understood that securing properly qualified teachers for industrial schools is absolutely necessary.

More recent words have been uttered in print by Swanson and Kramer (1965) in their consideration of professional training of all vocational teachers. They contend:

> Just as there is a need for a more comprehensive program for the preparation of individuals to enter the labor force, so it follows that the program of preparation for the vocational teacher must be more rigorous and often quite different from those now provided. Collegiate preparation of vocational teachers--earlier thought by many to be somewhat inconsistent with the basic vocational education philosophy--is becoming more and more accepted as logical and necessary. This is not to suggest that the vocational education teacher's need for successful work experience in the occupation in which he will be teaching is considered to be any less important.

And last but not least, Woodring (1960) reminds those really concerned about the preparation of teachers that a liberal education is needed for all teachers if a free nation is to survive and prosper. He feels that all citizens must, within the limits of their ability, also be liberally educated.

Teacher Competencies

Although not enough work has been done, some effort has been made to identify competencies needed by trade and industrial teachers. Methodology used has been in the most part a questionnaire technique or some modification of it. The judgmental procedure using a jury to validate a checklist of items, has served as the process to get at the teacher competencies needed. It is, therefore, somewhat surprising that more innovative procedures, especially those which stem from a belief in occupational analyses, have not been more extensively used. Moreover, it might be noted that the critical incident technique used by Flanagan could well serve the further study of T. and I. teacher competency.

A bench mark study, which will remain in the minds of many for some years to come is that of Walsh (1960). Although pointed toward the evaluation aspect of the teacher education endeavor, the Walsh study found its basis in teacher competency identification. In carrying out the study, the following seven steps were undertaken: 1) a list of identified competencies of trade and industrial teachers was developed and then refined by a national jury; 2) successful trade and industrial teachers appraised the importance of the competencies identified; 3) teacher educators appraised the importance of the competencies identified, and a comparison was made of the appraisal of the two groups; 4) a composite rating of the competencies by teachers, supervisors, administrators, and teacher educators was made; 5) an evaluation of the proficiency and preparation of trade and industrial teachers was made; 6) an evaluation of the contribution of education and experience to teacher competency was made; and 7) a summary of findings and suggestions for additional research was made.

The findings of this study included, among others, at least eight significant points for this review: 1) teachers of trade and industrial education need many distinctive skills and abilities in addition to those required by regular classroom teachers; 2) a list of 107 teacher competencies was appraised as being valid; 3) there was a high degree of agreement between ratings given the 107 competencies by teachers, state and local supervisors, and teacher educators; 4) competencies in the category of teaching methods and techniques were most often rated high in importance, while competencies in the category of shop and classroom organization and management rated low on the scale; 5) the teachers considered "most important" and "very important" those competencies which expressed ability "to do" something rather than those indicating knowledge or understanding; 6) the three courses listed as contributing most to teacher success were: a) trade analysis and course construction, b) methods of teaching industrial subjects, and c) development of instructional materials; 7) supervised practice teaching, planned observation of teaching, and planned visits to industry were rated high by teachers and teacher educators; 8) teacher educators and state and local supervisors expressed dissatisfaction with the general level of preparation of trade and industrial teachers. Only 40 percent of this group indicated they were satisfied with the level of preparation.

Moeller (1961) took the tack that the aims and supporting principles for the direction of programs of industrial teacher education should be evaluated by representatives of labor and industry. Interviews with thirty-eight selected representatives of labor and industry were conducted. Although the sample was saml1, the findings should be included in this report. The findings include: 1) well-defined competency levels, such as the commonly held concept of journeyman status for trade occupations, should be established for the several broad areas serviced by teachers of trade and technical subjects; 2) apprenticeship experience is essential for teaching the manipulative phases of trade occupations, but is not necessary for the theoretical or "related instruction" phases of an occupation. For more advanced levels of instruction, such as those necessary for upgrading programs in the skill trades and for preparing technicians, the cooperative work study program is tentatively the best approach; 3) an understanding of the social aspects as well as the technical processes of industry is essential for all teachers of industrial education and is best achieved through a balanced program of both academic orientation and actual work experience, neither of which is adequate by itself; 4) all teachers of industrial education must be thoroughly competent in all phases of the professional aspects of teaching and should experience as broad a background in the liberal education phase of their preparation as teachers of other disciplines.

In an attempt to evaluate trade and industrial education in the State of Ohio, Reese (1954) studied the nature of the problems found by beginning trade teachers during their first four years of teaching. The sample for this study involved 275 T. and I. teachers of which 240 responded. The results of this study indicated that the list of factors dealing with 1) personal qualities, 2) teaching techniques, 3) class organization and management, 4) instructional materials, exhibits and visual aids, 5) instructor knowledge and activities, and 6) physical conditions of shop and related laboratory was a valid list to identify the beginning teacher problems. Reese concluded that: 1) teachers do not recognize as potential problems their own personal characteristics or qualities; 2) a major need of beginning T. and I. teachers involves problems concerned with techniques, practices, and resources to be used in providing instruction of students; 3) because of the wide diversity of problems encountered by beginning T. and I. teachers, an in-service teacher-training program composed of short units appears to be more feasible and practical than a program organized of courses which operate for a full school period; and 4) the T. and I. training program has failed to devote sufficient attention to those problems of beginning teachers which may result from personal characteristics.

Returning to Walsh (1960), his technique included the use of a committee of experts to identify basic groups of competencies which numbered 107; these were further refined by a national jury. The resulting competencies were then evaluated and appraised (rated as "very important," "important," "less important," "not important") by 514 successful teachers of T. and I., 228 state and local supervisors, and 120 T. and I. teacher educators.

Teacher educators rated eleven competencies as "most important"; these included: 1) a knowledge of objectives of vocational education; 2) how to analyze a trade; 3) the ability to motivate students; 4) how to demonstrate skills; 5) how to stimulate and maintain interest; 6) the teaching of safety; 7) a knowledge of principles of learning applied to teaching T. and I. subjects; 8) methods of teaching related subjects; 9) developing attitudes in students in regard to safety; 10) an understanding of how a learner acquires skill and knowledge; and 11) developing appreciation of good workmanship.

The relative importance of competencies of T. and I. teachers according to teachers themselves, state and local supervisors, and teacher educators was discovered to be: 1) the ability to develop student attitudes toward safe practices and safety consciousness in job performance; 2) the ability to demonstrate skills; 3) a knowledge of methods of teaching shop subjects; 4) an understanding of the objectives of T. and I.; 5) a knowledge of methods of teaching related subjects; 6) the ability to arrange questions in instructional order; and 7) the ability to motivate students to acquire skill and knowledge.

Still reporting on the Walsh study, evaluations were made by 121 state supervisors of trade and industrial education, ninety-one local supervisors of T. and I., and 103 teacher educators of the competencies of recently trained T. and I. teachers. They expressed their degree of satisfaction in relationship to twenty-four aspects of the teacher-training program; they responded by grouping "yes," "no," or "undecided" answers. The respondents were generally satisfied with: 1) ability to demonstrate the skills of the trade; 2) ability to develop safe work habits; 3) experience in the skills of the trade (trade competency possessed); 4) understanding of objectives of vocational education; 5) tendency to teach at appropriate level; 6) ability to maintain discipline. Considerable dissatisfaction was shown for: 1) experience in developing instructional materials; 2) preparation in testing and evaluation; 3) orientation to total educational program of the community; 4) orientation to the types, locations, and services provided by community organizations concerned with industrial education. The same persons were asked to indicate their satisfaction with the general level of preparation of recently prepared T. and I. teachers. Forty percent were satisfied, 45 percent were dissatisfied, 15 percent were undecided. Breaking this down into discreet groups, it was found that 45 percent of local directors were satisfied, 39 percent were not, and 16 percent were undecided. Forty-one percent of state supervisors were satisfied and 35 percent of the teacher educators were satisfied with their trainees.

Three years later, Schaefer (1963) attempted a less ambitious study in relation to the development of an unfolding trade and industrial teacher education program. Responses to a questionnaire based on the Walsh listing of competencies included thirty local directors of vocational education and fifteen leading teacher trainers. The question asked was, "What makes the difference between a usual and a superior teacher?" It was noted that a high degree of correlation (.76) was found between the thinking of the two groups. High on the rank list of competencies was knowledge of subject matter (skill included); low on the list was an understanding of the history of education.

Lastly, writing a report for W. E. Upjohn Institute for Employment Research, Smith (1963) reminds us that:

> . . . the usual teacher education courses required for vocational and technical teachers should be confined to those that are relevant. The teacher institution must make arrangements with industry to provide the trainee with the practical instruction and experience needed in his chosen occupational skill . . . . Not enough is known yet about what makes the good vocational teacher. The conventional requirements for certification are quite inadequate. There is much to be learned before certification requirements for vocational education teachers should be rigidly fixed.

Program Organization

Studies of trade and industrial teacher education program organization have not been abundant. Walsh and Selden (1965) remind us that:

> The quality of any educational program is directly related to the quality of instruction. In vocational education, the first measure of quality is a level of competence of its shop, laboratory, and classroom teachers. Some of the competencies of vocational education teachers are the same as those required of all teachers, but the objectives, occupational structure and occupational pattern of vocational education call for a host of specialized abilities and understandings as well . . . . The instructional program is based on requirements and practices of occupations. And teachers must be equipped by practical experience and professional training to provide students with the occupational skills, knowledge, attitude, and appreciations they need to fulfill their aims . . . . Teachers must be skilled in 'how to teach' students with vocational goals as well as in 'what to teach' these potential workers. Teachers must not have only general understanding of the learning process but an understanding of how people learn in a vocational environment . . . . Teachers must be qualified to provide not only group instruction but individual instruction.

In the now heralded report of the Panel of Consultants (U. S. Department of Health, Education, and Welfare, 1963), a number of general observations relative to trade and industrial teacher education were made. Among them were the statistics that in 1960-61 there were 11,474 teaching positions in day schools representing eighty occupational fields, 16,280 teaching positions in evening programs, and 7,472 teaching positions in part-time programs. The report goes on to relate that occupational competency needed in so many fields precludes teacher education programs from incorporating occupational content in their curricula. Occupational competency is usually obtained through work experience. Teacher education for T. and I. is restricted to professional education and general education plus content courses for updating in-service teachers. For the most part, teacher preparation in T. and I. takes place after initial employment. The pattern of teacher education varies by states. About half of the states and territories have designated an institution of higher education to provide the teacher training; one-sixth have appointed teacher training staffs within the framework of the state education department; and one-third have assigned to their state supervisory staff the dual function of supervision and teacher education. Various patterns are used in teacher education programs: 1) full-time T. and I. programs resulting in baccalaureate degree; 2) part-time pre-employment training; and 3) in-service programs. Teacher training programs for related teachers differ from those for the shop teacher in some institutions with heavier emphasis on classroom and drafting room teaching methods.

The problem of obtaining teachers for T. and I. who have adequate occupational experience, good basic education, and professional training might be solved by utilizing a cooperative-type training program. Teacher education programs for trade extension teachers have been limited or not provided at all. Some states use a program providing thirty to sixty clock hours of instruction among areas such as methods, demonstration, course organization and planning, and instructional aids. Other states use a correspondence course for this purpose according to the 1963 Panel of Consultants' Report. Walsh (1958), in an analysis of several studies in the field of trade and industrial teacher education, gathered data that showed three distinct patterns for the operation of teacher training programs: 50 percent of the states used the state college or university; 30 percent were using their state supervisory staff; and 17 percent were using a state staff of teacher trainers. Of those responding to the study, only 40 percent of state and local supervisory personnel expressed satisfaction with the preparation of trade and industrial teachers, 45 percent expressed dissatisfaction, and 15 percent remained undecided.

A recent report entitled, "Summary Report of Vocational-Technical Program Development by States" (U. S. Department of Health, Education, and Welfare, 1965) says little about the programs of teacher education, but twice mentions that states are concerned about the development of programs of in-service teacher preparation, summer workshops, and the need for more teachers to staff post-secondary programs.

Back in 1955, the National Association of Industrial Teacher Educators produced a brochure entitled, Report on Cooperative Teacher Education, which called attention to the use of cooperative programs to produce competent T. and I. teachers. This early work attempted to describe several successful patterns of operation. Lux (1959) undertook a study to find a method of providing the State of Illinois with an adequate number of trade and industrial teachers competent both in their trade and in the teaching profession. Among the conclusions that were reached, Lux recommended that the professional leadership should develop programs which combined the basic elements of cooperative teacher education. Also, state departments of education should re-evaluate their certification requirements for trade and industrial teachers. Ramp (1962) reported that some agreement concerning the cooperative approach to providing skilled training for T. and I. teachers emerged from the 1960 Trade and Industrial Education Branch of the U. S. Office of Education's Conference on "Quest for Quality." At least in Ramp's opinion, one possible approach towards supplying public schools with qualified vocational industrial teachers, who are also acceptable to the general faculty, is the cooperative trade and teacher training program. Those engaged in this program believe it is more desirable to train a young person whose original occupational choice is vocational industrial teaching. Ramp goes on to state that the plans approved in 1958 by the Illinois Board for Vocational Education require the prospective teacher to graduate from a two-year, post-high school vocational-technical institute curriculum offered by an approved school. Upon completion of this program, a student may transfer to the university's industrial education department. Here he takes the general education and teacher training courses required for university graduation. In addition to the course work, a student works twenty-four months in full-time employment in his trade area.

Nor should programs of in-service teacher preparation be overlooked. Teufner (1961) emphasizes the fact that there is need for continuous education of the teacher. Rapid technological advances have forced industry to perfect its own formal education program, and there is a need for those in education to upgrade in-service offerings. Examples of concern for such offerings are given by Brown and Davis (1964), and by Kindred (1964) who reported on a recent institute held at the Miami-Dade Junior College. This latter reference illustrates the present emphasis being placed on in-service institutes by the Vocational and Adult Research Branch of the U. S. Office of Education. It is reported that during this year alone some twenty-six summer institutes will be funded. Federal funds in the amount of $200,000 have been approved for their operation. The need for physical facilities designed to meet the varying deamnds of all types of in-service programs cannot be ignored. Larson (1966) has studied these needs and has developed a unique design incorporating flexibility and maximum utilization. He recommends that a number of such centers be constructed at major institutions throughout the country.

The In-Service Offerings

Emerson (1958), a recognized authority for many years, alluded to the offerings of pre-service and in-service training of teachers by stating:

> Vocational-technical education has many implications for teacher trainers. We are in a state of change; but looking ahead does not necessarily mean that we should give up the teacher training programs we have been conducting, nor should we discontinue training teachers for some of the same areas we have trained them for in the past. We are still going to need many of these teachers. Changing conditions are demanding higher standards in many areas. We must take what we have been doing, pick the best elements, and use them.

More specifically, and in a discussion of improved teacher competency, Bowler (1958), Spence (1962), and others believe that successful teachers indicate that the most important area of a teacher training program is the supervision of practice teaching. An Office of Education teacher training study revealed that less than 10 percent of the teacher trainer's time is devoted to such supervising practices. Spence makes a case for more help for beginning teachers and suggests that sometimes advice from "old timers" can be damaging.

According to a study by Littrell (1965), there is a tendency to feel that cooperating teachers take advantage of student teachers and exploit them for personal gain. Assuming that there is some truth in this, is it necessarily bad? Some exploitation of student teachers seems to be normal. The student teacher usually lacks confidence. He looks forward to working with an expert (the cooperating teacher) who will guide him in learning how to teach as well as in helping him to increase his knowledge of the subject matter. The results of several inquiries have led Littrell to conclude: 1) student teachers expect to be exploited; 2) student teachers do not want to be substitute teachers so that cooperating teachers can take a rest; 3) student teachers may not be exploited as much as college supervisors might suspect; 4) in areas where cooperating teachers are weak, student teachers are probably encouraged to make presentations; 5) student teachers want to have the experience of complete planning and control of a class; and 6) careful selection of cooperating teachers is necessary.

Price (1958) supports the notion that more supervision is needed of teachers who teach trade extension type programs.

A major function of trade and industrial teacher education has been recognized as in-service education. A true definition of the term implies (at least in other areas of education) that teachers are initially prepared and subsequently kept prepared through credit and non-credit offerings. In our use of the term, we are often misleading since we call anything related to teacher education in-service training whether the teacher is initially prepared to teach or not. That is to say that the new inexperienced individual, once being hired--whether or not he has had the first course in pedagogy--is immediately classified as an in-service teacher when actually he is probably receiving only pre-service content. Consequently, the true pricture of providing in-service or updating kinds of offerings is not as rosy as it may seem. Brown (1963) implies that retraining is needed in teacher education due to rapid technological advances. The following are part of the program used by the Phoenix, Arizona, schools to achieve this goal: 1) providing an orientation week for all teachers prior to the opening of the fall term; 2) offering instructional improvement half-days four times per year; 3) encouraging enrollment in college extension courses; 4) providing summer workshop opportunities. Brown concluded that the quality of new teachers has improved over the years. Micheels (1965) reminds us that we have reached that point in time when the quality of a total school program can be measured directly by the quality of the in-service education program. Moreover, any in-service programs should be geared toward change, and a major aim should be to create a positive attitude toward goals identified by the staff.

By the way of evaluation, two studies seem appropriate. Brantner (1962) conducted a study in Pennsylvania by means of a checklist to ascertain the attitudes of T. and I. teachers on the adequacy of the instruction they received. A majority of the teachers rated the instruction as adequate on 175 of the knowledges and abilities included in the checklist. There was significant relationship between the attitudes of the vocational administrators and teachers in rating the competency of application to teaching duties. A significant relationship between the adequacy of instruction and competency of application was evidenced. In a similar manner, Ryan (1963) surveyed 174 North Carolina trade and industrial teachers with the result that 80 percent or more of the teachers experiencing problems in fifty-six items indicated that they had received help while more than 30 percent of the teachers experiencing problems on eleven items indicated they had received no help from their teacher training program.

The Connecticut Department of Education (1963) conducted a study to determine the activities of the teaching staff which tend to improve their effectiveness as teachers. The results show that over half of the teaching staff (252 out of 416) were engaged in some activity which provided them with additional knowledge and skill applicable to their teaching role. These activities consisted of formal courses, workshops, teaching and work experience. Many instructors participated in more than one activity, such as enrollment in courses and working in industry. Sixty-seven trade instructors or approximately 30 percent participated in trade workshops such as sponsored by the General Motors Corporation or were employed in trade related occupations, thus providing them with insights into the latest developments and techniques in their specialized field.

Ginther (1964) looked at the graduate offerings in industrial education in the United States. He studied the ways and the extent to which specialized technical competencies, teaching and administrative competencies, and provisions for general and liberal education were being provided. Among other things, he determined that: 1) the number of semester hours offered in graduate courses in industrial education ranged from twelve to 164 with a mean of approximately forty-nine per institution; 2) less than 40 percent of the respondents indicated that graduate students were required to take some technical courses, but about 70 percent indicated that technical courses were recommended; 3) industrial experience was not a general requirement; 4) the required areas of course work reported most frequently were history and philosophy, administration and organization, and curriculum content and organization; 5) about 30 percent of the master's programs, two-thirds of the specialist programs, and 80 percent of the doctoral programs required teaching experience ranging from one to three years; 6) relatively few graduate students were required to take specific courses in professional education other than in industrial education; 7) one-third of the respondents reported that general and liberal education courses were required, and two-thirds reported that such courses were recommended; and 8) the portion of time actually devoted to the development of specialized technical competencies in the master's and doctoral programs was considerably less than the time the respondents believed should be devoted to this purpose. Swanson (1964) made a similar evaluation of master degree level programs. He found that the programs were strongest in the area of professional education. Research and technical education ranked about the same. The weakest educational area was general education. There was divergence of opinion on the type of graduate program which should be pursued.

The Picture

To give some idea of the results of the effort, it is interesting to note that there is some improvement in the degrees earned in trade and industrial education as reported in the Department of Health, Education, and Welfare's Summary Reports (1962-1963 and 1965). The following table shows the earned degrees conferred for the academic years 1961-62, 1962-63, and 1963-64.

	1961-1962	1962-1963	1963-1964
Bachelor	620	657	704
Master	211	186	210
Doctorate	11	7	13

Included in the above were data concerning degrees earned by women in trade and industrial education. These data are listed below:

	1961-1962	1962-1963	1963-1964
Bachelor	17	25	13
Master	14	27	22
Doctorate	0	0	0

Summary

No attempt will be made to summarize the report just presented as at best it is a summary in itself.

A word does appear appropriate, however, relative to the lack of hard-type studies that have been obvious by their absence. It is apparent that little has been done during the past decade to take a hard look at trade and industrial teacher education. It might be rationalized that we are just too busy, the challenge too great, and the time too short. But the fact remains, more studies of the sophisticated type and less of pure conjecture need to be undertaken. Answers to questions of where we are, and where we should be going cannot be found until we do just that.

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REPORT OF ANALYSIS OF SOURCES OF TRADE AND INDUSTRIAL TEACHERS

by

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At the suggestion of Dr. Cotrell, I made a survey. A questionnaire was sent to all of the state supervisors of trade and industrial education throughout the country. In the interest of getting a little bit of additional information, we also surveyed the supervisors of technical education throughout the country.

At this time, we have received answers from thirty-five state supervisors of trade and industrial education (See Table 1) and thirty-four supervisors of technical education. Since preparing the report, three additional replies have been received, only two of which could be used, because the third turned in the answers in terms of percentages instead of numbers.

To consider the sources of T. and I. teachers, your attention is called to the T. and I. columns labeled "high school" and "post-high school." In these columns, you will see the information which we received from the state supervisors with respect to the number of beginning teachers for the current year. Incidentally, we hope that those responding interpreted this correctly.

You will notice that last year the high schools employed (in thirty-five states reporting) 621 instructors from industrial employment and 302 in the post-high school programs from this source.

For the high schools, 122 were employed from non-vocational teaching positions, and for post-high school positions, 103. We are presuming that prior to their employment as T. and I. teachers, these were industrial arts teachers, science teachers, or mathematics teachers. As an example, when I filled out one of these forms myself, I went down our list of teachers, and as I came to the name of a teacher who was new this year, I said to myself, "From what previous category did he enter this teaching position?" So, I placed the tally on the sheet in the appropriate place. If he were a science teacher the year before last and was presently teaching related instruction in the vocational program, I placed him in Item 2 as having come from a non-vocational teaching position.

Incidentally, in this survey, we were primarily concerned about the sources of the new teachers; consequently, in filling out the questionnaire myself, I included the cooperative program teacher-coordinators (what you call ICT, DCT, or DO) as well as teachers for other T. and I. programs. It has been my observation that practically all of these teacher-coordinators have a background of non-vocational teaching experience.

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Table 1
Sources of Beginning T & I and Technical Teachers for the 1965-66 School Year

Sources of Teachers	Number of Teachers Employed*			
	T & I		Technical	
	H.S.	Post H.S.	H.S.	Post H.S.
1. Industrial employment	621	302	51	101
2. Non-vocational teaching	122	103	3	5
3. The military services	27	10		6
4. Full-time college or university preparation	103	50	5	52
5. Full-time employment and part-time degree program	33	8	1	2
6. Part-time employment and part-time degree program	11	2		39
7. Private vocational school	1			
8. Industrial employment (hold Industrial Education Degrees)	2			
9. Evening instructors		60		
10. MDTA teacher & adult teacher		2		
11. Industrial employment (Engineering Degrees)				2
Totals	920	537	60	207

* The number of teachers employed is based upon reports from 35 state supervisors of T & I and 32 state supervisors of technical education.

I have called this a survey, not research. We do not have a perfect picture, but, at least, we have shown the trend, and I think we can go from there. You know the distribution with respect to those who have come from military service, that is Item 3, and from Item 4, full-time college or university preparation.

In Item 5, we have the full-time employment and part-time degree program. You notice, there were not very many in that category.

Item 6 indicates there were not very many from part-time employment and the part-time degree programs.

Items 7, 8, 9, 10, and 11 on the questionnaire sheet were listed as "Others." Consequently, all we did was tabulate the comments. In 7, somebody said that he had one from a private school vocational program. In 8, two people said that they had employed two teachers from industrial employment who held industrial education degrees. A number of schools said that teachers were recruited from the evening instruction staff. In Item 10, a couple of schools said they had recruited some from the Manpower Development and Training programs, but there were none from this source in the T. and I. area.

We asked each state supervisor to report any surveys or studies of sources of teachers within the state. We found that the supervisors did not acknowledge such studies. At least, it was not coordinated with the state supervisor if it had been made. I think this is as much the fault of the state supervisor for not keeping his nose into the business of the teacher training job as it is of the teacher trainers not reporting it to the state supervisors.

Does the picture here look the same as you expected it to be in terms of most of the teachers coming from industrial employment?

As nearly as I can see, this gives you a trend with respect to the source of our teachers.

ANALYSIS OF TRADE AND INDUSTRIAL TEACHER EDUCATION PROFESSIONAL LITERATURE: INSTRUCTIONAL METHODS, INSTRUCTIONAL AIDS, TEST CONSTRUCTION, SHOP MANAGEMENT AND SAFETY

by

Edward K. Hankin*

This investigation sought to identify and assemble in bibliographical form the textbooks, reference books, and other published materials relevant to instructional procedures used in trade and industrial teacher education. It further sought assessments of these publications as to their suitability in terms of the competencies to be developed and as to needed revision or replacement. Efforts were also made to identify areas of instruction for which suitable publications are not available but are needed.

Basic data were gathered by sending inquiries to the head trade and industrial teacher educators in all states as identified in the directory published by the U. S. Office of Education. Twenty-six responses, representing twenty-three states, were received prior to the preparation of this report. A copy of the inquiry letter and a listing of the respondents are appended to this report. Because of time limitations and the abundance of material received from the respondents, no follow-up procedure was employed.

Most of the responses were in the form of bibliographies, some of which were specifically identified with areas of instructional procedures. Others covered the whole field of trade and industrial education. Several of the respondents identified useful publications which needed revision or updating, and some suggested areas for which suitable published materials were not available.

In only a few instances were specific volumes identified as "textbooks." For the most part, the bibliographies were in the form of reference listings, presumably implying a common practice of employing library or bookshelf references for collateral reading as opposed to the purchase of textbooks by each student.

There are several possible explanations of this situation. First, the courses taught in trade and industrial teacher education programs vary widely in scope and content. If the references employed are used as a basis of comparison, these variations derive from two different characteristics of teacher education programs. The first difference has to do with the way in which the instruction is structured. In some places, omnibus courses are taught covering all aspects of instructional procedures from "how to give a demonstration" to "how to construct test items." In other places, two or more courses are given pertaining to aspects of instructional procedures under such headings as "Test Construction, Testing and Evaluation," "Construction and Use of Instructional Aids," Teaching Methods," and "Shop Management."

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There also appears to be wide dispersion in the way this area of teacher education is approached. At one extreme is the "kit of tools" approach to teaching methods. Little attention is given to the psychology of learning and other underlying principles for instructional procedures. Heavy emphasis is given to the "how to" mechanics of teaching methodology with minimum attention to understandings of the learner and the learning process. On the other extreme, there is heavy emphasis on the underlying principles with less attention to the mechanics of teaching; presumably on the assumption that with such a foundation the instructor can creatively devise his methodology to suit varying situations. Most of the submitted reference lists suggest approaches to T and I teacher education somewhere in a continuum between these extremes.

There is a possible third explanation of why textbooks are not more generally employed in T and I teacher education. This is the bias of long standing among many T and I teacher educators against "textbook teaching." Because they try to instill in their students an avoidance of "teaching from the book," with all that this implies as "bad" in some academic teaching, they hesitate to use textbooks themselves for fear of poisoning their own wells. Even if suitable textbooks are available, such a bias would inhibit their adoption.

Under these circumstances, authors and publishers have great difficulty in coming up with volumes which would satisfactorily serve as "textbooks" for such a wide range of approaches to teacher education. To the extent that they can not--or do not--do this, textbooks are not adopted and the market for publications is so limited as to discourage authors and publishers from making the investments required.

On the other hand, when teacher educators are unable to find volumes which are up-to-date and which cover the scope and content of the particular courses they teach, they are reluctant to require their students to purchase several volumes each of which only partly relates to the course. Therefore, they designate no textbook to be purchased by each student and resort to the apparently widespread practice of library or bookshelf references for collateral reading.

Summary of Findings

The following bibliographic information is listed under four descriptive headings (Office of Education, 1960, pp. 17-21): (1) General Instructional Procedures; (2) Construction and Use of Instructional Aids; (3) Test Construction, Testing and Evaluation; and (4) Shop Management and Safety. Under each of these headings is given a brief description of the scope of the area of instruction and a listing of the teacher competencies to be developed. These competencies were extracted from the report on Walsh's study, Teacher Competencies in Trade and Industrial Education, using his listing of these competencies in rank order of importance. The number preceding each competency indicates its rank as reported.

Following the listing of competencies in each section are the volumes identified as "textbooks" by the respondents. The remainder of the volumes and other published materials listed under each category were reported as references by the respondents. Each reference reported by the respondents for a particular instructional area is listed as reported. No effort was made to question the suitability of the respondents' classifications. In several instances the reported references were in incomplete bibliographic form. Where possible additional information was included as required by good bibliographic practice. In some cases such needed information could not be obtained up to the time this report was prepared. Some volumes were reported in more than one category because of the breadth of coverage of the volume. A classic example is Struck's, Creative Teaching, portions of which relate to each of the four course areas.

Course Area One--General Instructional Procedures. Understanding the learner and the learning process. Understanding and appropriate use of instructional procedures.

Competencies

2. The ability to stimulate and maintain interest throughout the instructional process.

5. The ability to demonstrate the skills of the trade.

6. A knowledge or understanding of methods and/or techniques of teaching shop subjects.

8. A knowledge or understanding of methods and/or techniques of teaching related information.

10. The ability to motivate students to acquire skill and knowledge.

14. The ability to recognize the individual differences in physical, mental, and social traits of each student and to make provisions for them.

16. A knowledge or understanding of individual differences in the learning process.

20. The ability to assist students in identifying and resolving problems.

27. The ability to place emphasis on student learning rather than subject matter.

28. A knowledge or understanding of the principles of learning applied to teaching trade and industrial subjects.

31. A knowledge or understanding of how a learner acquires skill and knowledge.

35. The ability to use a wide range of techniques, materials, and methods in teaching.

37. The ability to utilize effective questioning as a teaching tool

38. The ability to teach related information and/or manipulative operations using the 4-step plan of instruction.

42. The ability to make provision for individual differences in the instructional plan.

57. The ability to teach a group of students having wide chronological and mental age ranges.

58. The ability to lead a group discussion.

66. A knowledge or understanding of the sensory aspects of learning.

83. The ability to organize material for directed study.

92. The ability to present information graphically.

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Competencies

33. The ability to select and use instructional materials and references suited to the student's level and interest.

63. A knowledge or understanding of sources of procurement and methods of using special educational material, audio-visual aid, and other devices for increasing teaching efficiency and appeal.

65. The ability to utilize audio-visual aids effectively in the shop or classroom.

67. The ability to evaluate the effectiveness of teaching aids and adjust them to the demand of the teaching situation.

79. A knowledge or understanding of the types of teaching aids, their utilization and limitations.

104. A knowledge or understanding of techniques for proper maintenance and storage of teaching aids and audio-visual equipment.

107. A knowledge or understanding of the important features and maintenance requirements of projection and duplicating equipment.

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Course Area Three--Test Construction, Testing and Evaluation. Preparing and administering written, oral and performance tests and rating scales. Appropriate use of published tests, related statistics, interpretation of test results, and assignment of mark.

Competencies

41. A knowledge or understanding of procedures for evaluating and recording student achievement.

54. The ability to maintain progress charts and records of individual student achievement.

69. The ability to construct objective tests to measure student achievement.

81. The ability to devise instruments for the evaluation of instruction.

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Course Area Four--Shop Management and Safety. Personnel organization. Administrative activities relative to supplies, tools, and equipment. Housekeeping and shop layout. Provisions for student safety and safety instruction.

Competencies

1. The ability to develop student attitudes toward safe practices and safety consciousness in job performance.

3. A knowledge or understanding of safe practices in teaching and operation of industrial equipment.

4. The ability to develop appreciation of good workmanship.

13. The ability to develop student attitudes for the care and conservation of equipment and materials.

15. A knowledge or understanding of acceptable standards of workmanship for trade entrance.

19. The ability to establish and maintain acceptable standards of discipline.

29. The ability to assemble the necessary tools, materials, and information for the teaching process.

40. A knowledge or understanding of principles of school shop management.

61. A knowledge or understanding of the mechanics of class organization and student personnel management.

68. The ability to organize procedures for the maintenance of tools and equipment.

73. A knowledge or understanding of the procedures for the storage and control of tools, supplies, and materials.

74. The ability to plan a shop layout for efficient instruction.

96. The ability to select and order special materials, supplies, and equipment.

97. The ability to maintain proper business records and accounts.

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II. Combustible Solids, Dusts, Chemicals and Explosives
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SUMMARY AND EVALUATIONS

Copies of the foregoing published materials were not obtained and examined as a part of this investigation. Limitations of time and funds did not permit the acquisition of volumes used in other places which were not available at the center where the study was made. Furthermore, a number of volumes are out of print and not readily available under any circumstances.

The respondents were asked to identify volumes which needed revision or updating and the needs which they recognized for new books in these areas of instruction. Many of the responses included such information. In a few instances attention was directed to certain recent publications which merited recognition.

The following volumes were specifically identified as needing revision and updating:

Friese, John F. Course Making in Industrial Education. Peoria, Illinois: Charles A. Bennett Company, 1958.

Micheel, William J., and Karnes, M. Ray. Measuring Educational Achievement. New York: McGraw-Hill Book Company, Inc., 1950.

Selvidge, R. W., and Fryklund, Verne C. Principles of Trade and Industrial Teaching. Peoria, Illinois: Charles A. Bennett Company, 1946.

Silvius, G. Harold., and Curry, Estell H. Teaching Successfully the Industrial Arts and Vocational Subjects. Bloomington, Illinois: McKnight and McKnight Publishing Co., 1953.

(Dr. Silvius advises that a major rewrite and redevelopment of this book has been made. It is now in press and will be available about September 1.)

Struck, Theodore F. Creative Teaching. New York: John Wiley and Sons, Inc., 1938.

Weaver, Gilbert G. Shop Organization and Management. New York: Pitman Publishing Corporation, 1955.

Weaver, Gilbert G., and Bollinger, Elroy W. Visual Aids. New York: D. Van Nostrand Company, Inc., 1949.

Several of the responses were more general in that they did not refer to specific volumes. Some did refer to specific instructional areas. The following are some paraphrased quotes of this nature:

"We need a new textbook for shop organization and management."

"I know of no field in T & I teacher education that is in greater need of analysis than that concerning teaching methods."

"Texts now available for instructional methods in shop management and safety are inadequate."

"Struck's Creative Teaching, one of the best in scope and treatment, is out of date and out of print. If this could be revised, we in T & I teacher education would be extremely grateful."

"We need a new book on occupational analysis and a new text on developing instructional materials."

"We feel that revised and updated materials are needed in all of these areas."

"The books we have listed are all that we know of that are available. Because of their non suitability (sic) we have many pass-out sheets and outlines of our own that we use."

"The best manual in concise form is that produced by the U. S. Office of Education titled Preparation of Occupational Instructors. It seems that a similar manual with more detail for initial courses would serve a good purpose."

One last observation can be made on the basis of the responses to the survey used in this investigation. Practially all of the respondents indicated an interest and great concern with respect to publications available for use in their teacher education classes. Most of them requested a copy of the findings of this investigation and applauded the activity.

Much more needs to be done on this task than has been done thus far. It is hoped that staff with suitable resources will be made available to more carefully analyze the actual materials listed and to evaluate them in terms of the competencies to be developed. In this process, materials which are out of print or otherwise unavailable should be deleted from the listings and more specific recommendations made as to new volumes which should be written. Since the market for such new volumes is limited, it may be that public or foundation funds will be needed to subsidize both the writing and the publication of such new works. Certainly the important values of such endeavors would justify their pursuit.

ANALYSIS OF TRADE AND INDUSTRIAL TEACHER EDUCATION PROFESSIONAL LITERATURE: TRADE ANALYSIS, COURSE CONSTRUCTION, AND CURRICULUM MATERIALS DEVELOPMENT

by

Durwin M. Hanson[1]

> The quality of trade and industrial education is directly related to the level of competence of its shop, laboratory and classroom teachers. Skills, knowledge, attitudes, and appreciations acquired by students arise from the teacher's influence; therefore, the first measure of quality in trade and industrial education must be at the instructor level.
>
> Teachers of trade and industrial subjects are recruited from the ranks of journeymen and foremen of proven ability in their occupational field. The extent of their occupational experience and training provides the technical content for their teaching. However, for a skilled worker to reproduce his skills and knowledge in others, he must acquire certain essential teaching skills. He must be able to teach as well as to do. Teacher competencies must be developed through effective teacher-training programs.[2]

No doubt, the study of Teacher Competencies by Dr. John Walsh has been invaluable as a guide in revising the T. and I. teacher education curriculum. A review of catalogs from colleges and universities offering trade and industrial teacher education reveals changes in course titles and the addition of a number of new courses during the past ten years. One of the major items of concern to the T. and I. teacher educator is the selection of adequate textbooks and instructional materials to assist in the development of teachers in the categories of trade analysis, course construction, teaching methods, shop, laboratory, and classroom management, etc.

In an attempt to assay the needs for professional literature in trade and industrial teacher education in selected areas, a questionnaire was sent to a sampling of forty-seven T. and I. teacher educators. The reported results are based on the returns of thirty-six respondents. The areas of concern included Trade Analysis and/or Course Construction, Development of Instructional Materials and Vocational Curriculum Construction. For purposes of reporting, Trade Analysis is listed separately from Course Construction since a number of teacher trainers reported that these were separate courses for their given state.

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[1] Dr. Hanson is Professor and Head, Industrial Education Department, School of Education, North Carolina State University, Raleigh.

[2] Walsh, John P. Teacher Competencies in Trade and Industrial Education. Washington, D. C.: U. S. Government Printing Office, 1960.

Trade Analysis

Thirty-two representatives indicated a course was available under this given title or similar title such as Trade Analysis and Course Construction, and that the textbook generally used was:

> Fryklund, V. C. Analysis Techniques for Instructors, Bruce Publishing Company, Milwaukee, Wisconsin.

This particular text designed for the purpose of assisting new teachers in analyzing an occupation for instructional purposes (22, 32), has been well recognized since the original publication in 1942 which brought up to date, techniques from publications by C. R. Allen, M. W. Haynes, W. B. Jones, and R. W. Selvidge. The book also has value in developing competencies relative to arranging operations in an instructional order (9), organization of subject matter into instructional units (12), selection of appropriate jobs and other learning activities as vehicles of instruction (17), and related instruction (21). The above mentioned competencies are identified in Table 4 of Walsh's report by the number represented in parentheses.[3] The text is reported to be of some assistance in developing competence in combining jobs, operations, and related information into a course of study (26). A reported weakness is in developing in teachers the ability to prepare instruction, assignment, and information sheets (45); the main criticism is lack of examples and formats for instructional sheets.

Other textbooks used in trade analysis courses included the following, either as the basic text or reference material:

> Bollinger, E. W. and Weaver, G. G. Trade Analysis and Course Construction, Pitman Publishing Corporation, New York.

Several respondents indicated that this book was used as a required text along with Fryklund's book. A number of trade and industrial education teacher educators stated that this text offered beginning instructors another approach to trade analysis and also provided introduction in course development and organization. It was interesting to note that this book was used as a reference book or required text by all thirty-six respondents. This book was stated as having value relative to the competencies identified with Fryklund's book plus some assistance to new instructors in preparing progress charts and recording student achievement (54).

> Allen, Charles R. The Instructor, The Man and The Job, J. P. Lippincott Company, Chicago, Philadelphia, New York.

This book was listed as being used as a reference book by five respondents. One respondent stated, "The book is very limited in trade analysis but is used as a reference to provide an introduction to lesson planning."

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[3] Ibid., pp. 17-24.

Selvidge, R. W. How to Teach a Trade, Manual Arts Press, Peoria, Illinois.

Listed as a reference book by one respondent.

Friese, J. F. Course Making in Industrial Education, Charles Bennett Company, Peoria, Illinois.

Two respondents indicated use of this book as a reference. It was stated that this book was of value in the particular course in which trade analysis is taught with course construction. The book does make an introducation to objectives of trade and industrial education (7), although not as extensive as found in other vocational books. This book also includes a chapter on Class Organization and Shop Management which serves as a reasonable introduction to Competency Number 40--knowledge or understanding of school shop management. A chapter on Correlations in Courses of Study partially introduces the reader to information regarding relationship between vocational trade and industrial education and other phases of the educational program (39), particularly industrial arts.

Staton, Thomas F. How to Instruct Successfully, McGraw-Hill Book Company, New York.

Two T. and I. teacher educators indicated they were using this publication as a reference book. One teacher educator stated the book was of assistance in the Trade Analysis course "to acquaint students with principles of learning and teaching techniques as they develop trade analyses."

Rose, Homer C. The Instructor and His Job, American Technical Society, Chicago.

Two respondents indicated this book was included for reference use in their trade analysis courses. The main use of the book in a trade analysis course was cited as being helpful in understanding analysis and as an introduction to making a course of study including lesson plans.

Jackey, D. F. and Barlow, M. L. The Craftsman Prepares to Teach, The MacMillan Company, New York.

Three respondents indicated use of this book as a reference. One teacher educator indicated the value of this book was in the examples presented and in the assistance to T. and I. teachers in developing objectives.

Course Construction

Giachino, J. W. and Gallington, R. O. Course Construction in Industrial Arts and Vocational Education, American Technical Society, Chicago.

Six respondents indicated that this book was being used as the basic textbook and sixteen reported use of the publication as a reference book for this course. This particular book was reported as helpful to T. and I. teachers in development of competencies listed in rank order in Walsh's Table 4 as follows: 7, 9, 12, 21, 22, 26, 30, 34, 39, 44, and 45.

Bollinger, E. W. and Weaver, G. G. Trade Analysis and Course Construction, Pitman Publishing Company, New York.

Four T. and I. teacher educators indicated this book was used as the basic text and twenty-one included the publication as a reference book. Although this book was reported as being employed as the text for Trade Analysis in a number of states, it has been reported as a valuable book for course construction, particularly in assisting new teachers in organization of course material and preparation of instructional sheets and lesson plans.

Leighbody, G. B. and Kidd, D. M. Methods of Teaching Shop and Related Subjects, Delmar Publishers, Inc., Albany, New York.

Two respondents indicated this book was used as the basic text for this particular course. This book is widely used as a reference and has been reported as having particular value in assisting teachers in preparing lesson plans, instructional sheets, insight as to questioning, acquaintance with methods of testing, and recording and reporting student progress.

Rose, Homer C. The Instructor and His Job. American Technical Society, Chicago, Illinois.

Two T. and I. teacher educators listed this book as the basic text, and twelve indicated its use as a reference. This book, reported in the section on Trade Analysis, has been reported as being useful in preparing courses of study and lesson plans and of considerable assistance in developing an understanding of testing in trade and industrial education.

Silvius, G. H. and Bohn, R. P. Organizing Course Materials for Industrial Education, McKnight Publishing Company, Bloomington, Illinois.

Eighteen T. and I. teacher educators reported using this book as a reference text for Course Construction. Useful from viewpoint of formats and organization of material.

Friese, J. F. Course Making in Industrial Education, Manual Arts Press, Peoria, Illinois.

Thirteen listed this publication as useful as a reference book. Chapter on Related Content was identified as helpful.

Other publications, other than U. S. Office of Education Bulletins, reported by twelve respondents as being used as references included:

Barlow and Jackey. The Craftsman Prepares to Teach.

Allen. The Instructor, The Man and The Job.

Fryklund. Analysis Techniques for Instructors.

Selvidge. How to Teach a Trade.

Selvidge. Individualized Instruction Sheets.

Staton. How to Instruct Successfully.

Development of Instructional Materials

Dale, Edgar. Audio-Visual Methods in Teaching, Dryden Press, New York.

Three teacher educators indicated this book was used as the regular text, and twelve classified the publication as a reference book for this course or area of instruction. Comments included value of the book in assisting teachers in the use of audio-visual equipment and information concerning the range of community resources and instructional aids adaptable for use in T. and I. education. With reference to identification with the competencies listed in Walsh's Table 4, it is reported that the book is of some value in the development of competencies 33, 35, 63, 65, 66, 67, 79, 82, 92, 104, and 107.

Leighbody and Kidd. Methods of Teaching Shop and Related Subjects, Delmar Publishers, Inc., Albany, New York.

Two respondents indicated this as the basic text, and eleven reported its use as a reference book.

Giachino, J. W. and Gallington. Course Construction in Industrial Arts and Vocational Education, American Technical Society, Chicago.

Two reported this as the text, and five indicated it was used as a reference book.

The following publications were reported by fourteen respondents as being used as reference books:

Allen. The Instructor, The Man and The Job.

Anderson. Teaching Apprentices.

Association for Supervision and Curriculum Development, Individualized Instruction, NEA.

Bass. Fifty Hints for Teachers of Vocational Subjects.

Bollinger. *Trade Analysis and Course Construction*.

Bollinger and Weaver. *Visual Aids*.

Brown, J. W. *AV Instructional Materials Manual*.

DeKieffer, R. E. *Manual of A-V Techniques*.

Emerson, Lynn. *How to Prepare Training Manuals*. (This book was identified as being extremely helpful in reviewing formats for use in developing instructional materials and illustrations.)

Haas, Packer and Kuhn. *Preparation and Use of Audio-Visual Aids*.

Hill and Ewing. *Materials and Methods for Vocational Training*.

Proctor and Grufzu. *T-N-T for Teachers*.

Kinder. *A-V Materials and Techniques*.

Liberman, Irving. *The Backbone of Curriculum Development and Implementation: Instructional Materials*.

Minor. *Simplified Techniques for Preparing Visual Instructional Materials*.

Note: The consolidated bibliography includes those additional publications indicated for use in this category as reference book(s) by at least one respondent.

Vocational Curriculum Construction

None of the thirty-six respondents indicated the use of a basic text in this area of instruction. Publications identified for use as reference materials are included in the consolidated bibliography.

Summary

Typical comments by T. and I. teacher trainers regarding some of the available publications included:

> "There isn't a single book for 'co-op training'."
>
> "Old as the hills. Out of date."
>
> "Most texts for trade analysis need revision--include more examples."

> "Very few curriculum texts are of aid to trade teachers."
>
> "Too much mixture of disciplines in curriculum books."
>
> "Doesn't anyone revise T. and I. books?"
>
> "We use our State Department prepared materials."
>
> "Authors try to cover too much ground and, in so doing, the books on course construction lack depth."
>
> "Examples in books for industrial education include too much industrial arts."
>
> "We don't regularly use 'textbooks' in courses in these areas."

Most teacher educators agree that a textbook is necessary or essential for each course, and in the absence of "a" book to employ as the text, the next best solution is to present a list of references. The development of teacher training materials by a number of states, i.e., Ohio, New York, Texas, Missouri, etc., is a fair indication of the need for updated books, particularly for course construction and curriculum development. The U. S. Office of Health, Education, and Welfare has done a commendable job through the Division of Vocational and Technical Education of attempting to assist T. and I. teacher educators and teachers by providing bulletins such as the Automotive Service Specialist Suggested Guide OE-87015.

A question has been raised on a number of occasions as to the need for a trade analysis course since materials are readily available . . . "Why rediscover America again?" has been expressed by several individuals. The foregoing statement may, in part, account for the combination or merger of trade analysis and course construction into a single course by several T. and I. teacher education departments. In addition to reviewing and suggesting revisions of books in T. and I. education, perhaps it is also important that we study the specialized teacher preparation courses currently being offered, determine what publications are available to fit these needs, what publications need revision, and then identify areas where new materials must be developed.

It has also been suggested that a critical study be made of the 107 teacher competencies listed by Dr. Walsh to determine the items (competencies) that may be developed through general education and/or psychology courses and those competencies requiring specialized trade and industrial education and/or vocational education courses.

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ANALYSIS OF TRADE AND INDUSTRIAL TEACHER EDUCATION PROFESSIONAL LITERATURE: HISTORY AND PHILOSOPHY, SHOP PLANNING, AND INDUSTRIAL AND PUBLIC RELATIONS

by

Gordon G. McMahon

The invitation to present this paper has provided the necessary impetus to compel me to set down in some organized form, thoughts which have been troubling me since I first entered the field of teacher preparation for trade and industrial education. We are, in the long view, Johnny-come-lately to the public schools. Yet fifty years have passed since ours became a legally constituted area of instruction. This should have been sufficient time to give T and I an established place in the broad curriculum. The fact is that through most of these years, all of vocational education has been engaged in a struggle for recognition. In many instances, little more than a holding action has been possible in a battle for continued existence. Under such circumstances, we might be excused for our greatest failure--the failure to produce a body of literature specifically prepared for our field and adequate to sustain our pretensions to being a unique area in the broad field of education.

That no such body of literature exists today may reflect a basic difference between the life of the vocational educator and that of the professor of the humanities or the sciences. Where the latter has, as a rule, a carefully assigned number of student contact hours, with limited office hours and a generous measure of time set aside for research, study, and writing, all of us here today know the plight of the vocational man. He may be the itinerant teacher-trainer, traveling daily to counsel with teachers on the job, and teaching extension courses in whatever remote hamlet the need may arise. Or he may be a professor of vocational education, putting in a full working day at the office, teaching classes on campus, answering endless letters, counseling with all comers, and then driving off into the sunset to conduct another evening class for employed teachers. If he is a department chairman or the supervisor in the state office, he may spend most of his day planning, promising, promoting, and pleading to ensure that the department or the division retains its status and has reasonable hope of securing the funds necessary to its existence. In our field, eternal vigilance may quite literally be the price of life.

Unlike our colleagues in liberal arts, we have no quarter off to allow us time for the broadening effects of travel or an uninterrupted period for writing or study. As summer approaches, we are involved in the hectic last-minute arrangements for the summer session and girding for the influx of large numbers of adult students--a category quite unlike any other. No day is long enough to accommodate the stream of counselees who have learned, as few younger students ever do, the art of using their major professors as resource persons for every aspect of their lives. If the college teacher survives the summer and is not involved in a post-session, he may be able to find four consecutive weeks for his promised vacation;

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unless, of course, he has succumbed to the blandishments of some distant colleague and has already used his vacation teaching for someone else.

Facetious though this description may sound, it is painfully true that the nature of our work has made it extremely difficult for many of us to find that combination of time and inclination which is a necessary prerequisite to writing. Precisely how any of us can change this pattern is an individual matter. A few have managed to do it in the past. More must do it in the near future.

The Need

The "student" body in the teacher-training division of Trade and Industrial education is unlike any other. The members are, ideally, masters of a skilled trade, a condition resulting from years of work experience. They may be relatively young; they are more often quite mature adults. They may have had some formal education beyond the high school, but they also may have entered the teaching field with only a high school diploma or its equivalent. Above all, they are individuals, accustomed to rely upon their own skills and abilities for any success which they have achieved. In many cases, they are basically non-verbal, pragmatic, practical, and determined to secure the greatest possible amount of usable material from the education for which they are paying.

While this description is by no means universally applicable, it suggests some of the problems which face us in the analysis of existing literature and the projection of needed additions and changes.

Existing Literature

A casual glance at the well-stocked shelves in vocational departmental offices or in the library sections devoted to vocational education is reassuring. There are hundreds of volumes, many with comfortably familiar titles and with authors whose names are household words in T. and I. A closer view would be shocking to anyone who had not, long ago, become aware of the painful inadequacy of our libraries.

Most of the "standard" texts are old by modern measurement. Even the public schools in many states are encouraged to re-evaluate textbooks every five years with a view to replacing them. If we evaluated our available literature on the basis of copyright dates, we would be compelled to replace most of what we are now using, which would lead to an even more troublesome problem--that of finding replacements. Age alone, of course, is not necessarily a valid criticism. Some literary works are timeless; but in our field, where change has been almost constant in the last few years, a recent copyright date has become an important criterion.

Books written as late as 1957 or even 1960 must omit the most important advances in legislation since 1917. They cannot include the developments of ARA, MDTA, EOA, and the Appalachia Bill with their challenge to vocational education; nor can they tell of the vast changes made possible by the passage of the Vocational Education Act of 1963. The terms of that bill, with its possibilities for cooperative efforts by the different services and its challenge to creative thinking on the part of vocational education administrators and teachers, are the life blood of T and I today. A student directed to use a text written in the 40's or 50's might well be excused for wondering if he had chosen well when he entered a field in which nothing had happened in the last ten years worthy of being recorded.

There is no intent here to suggest that these books should be banned because of age. Among them are the classics in our field -- written by men who lived and formed vocational education. Their eye witness accounts are irreplaceable; but as text books for teacher education classes, they have drawbacks which cannot be ignored. They are verbose, lengthy, and repetitive of each other.

As I suggested earlier, while we have students with a variety of educational background, we can generalize that they are impatient of people and books which seem to be unnecessarily wordy. A book of 656 pages, for instance, is understandably a formidable obstacle in the eyes of our students.

A further criticism can be drawn from the fact that research in vocational education is still in its formative stages, with researchers groping for pertinent problems (or since 1963 grasping for available money). Research-based literature in T and I has not yet appeared. The generalizations in our older books may very well have been valid at the time of writing; but we must look at them very critically if we are to continue to offer this material to our present students. Statements about numbers and types of programs, placement of graduates, success on the job, teacher competencies, preferred methods of presenting necessary learnings may not even agree with our present limited knowledge. Worse yet, the research findings of the next few years may very well contradict a substantial number of our own most cherished beliefs.

The unfortunate tendency on the part of some people to lump together vocational education with industrial arts, possibly to render T and I academically respectable by association, is mirrored in the titles and text of some of our most respected literature. Industrial arts is an area of general education which merits respect for what it is. But it is no proper bedfellow for T and I. Our philosophy, when properly enunciated, stresses the very real difference between the two disciplines. The use of textual material which reassociates them is a contradiction which reflects poorly upon our judgment.

One of the most damning features of our libraries is the presence of very substantial numbers of "borrowed" books. The areas of methodology, public and industrial relations, guidance, industrial psychology, and others must rely upon literature specifically prepared for use in other educational fields. If we insist upon a definition of T and I education as an area of learning with problems and practices which are peculiar to it, we must accept the accompanying truth that texts not written to accommodate and explain these peculiarities cannot properly be considered adequate for our purposes.

There can be no argument with the use of outside material when the T and I teacher is taking courses in other departments in line with the generally accepted practice of requiring certain courses in the humanities and in general education. There, our "borrowed" books are on home ground and are being properly used for instruction in the areas for which they were written.

Vocational education offices have shelves and boxes full of state-prepared curriculum and other instructional materials. Many of these materials are well-written and valuable for their stated purposes. Many of them are sold outside their own states; but since so much of teacher preparation at the college level is conducted with students who either are or may become instructors in other states, we do well to choose carefully among these materials. Vocational education is not organized on the same bases in different states. Publications which may be extremely valuable in one state may have little relevance in another.

An interesting development has recently appeared in the line of revision and updating. One of the best known of our pioneer authors, now deceased, is being revised. Another has had several chapters lifted from a very lengthy text and reissued in attractive form. Authors who are still active have made revisions in their own work and undoubtedly many more are in progress. While this trend may serve us well as a stop-gap measure, it is disquieting for many of us to realize that it should be necessary.

One hopeful note is the appearance of numerous articles in leading journals and yearbooks. Probably the best modern writing on vocational education has appeared in these articles. As resource materials they are extremely valuable. Coupled with articles attacking or downgrading vocational education they make excellent reading for comparative studies.

While they hopefully wait for someone else to supply their textual needs, many professors of vocational education are forced to fall back upon personal experiences and upon the philosophy which they have developed through the years. While we hold that there is no substitute for experience, an entire course based upon anecdote can be both boring and ineffective.

Needed Research

One paragraph from a widely-read recent publication of the American Council on Education furnishes the key to the mystery of what kind of research needs to be done in T and I. After generalizing about the low status of our programs, the inadequacy of our teachers, the misguided system of training for particular jobs since technological advances negate this training, and after making various other statements which revealed the fragmentary nature of his information, the author remarked that these generalizations were admittedly unfair to the several outstanding vocational and technical programs in this country.

While we have little hope for reshaping the thinking of men who generalize on the basis of such limited knowledge, we can at least provide ourselves with research-based "facts" to use in our own generalizing. Whether we propose to quote statistics in writing on history, practice new or improved programs, or on methods of teaching, our basic research problems are the same. We need facts to bolster our beliefs. All evidence which is in to date suggests that we have been on even firmer ground than many of us believed. But we need proof to support continuation of present methods of change where it is indicated. We will not have this proof until the results of a great deal of research are in our hands. So many proposals have been processed through so many agencies since substantial research funds recently became available that it would be impossible to say without making an independent survey just what areas of interest to us are already being covered. At the risk, then, of including areas already under study, I propose that the following problems are of the type which needs attention.

1. Traditionally we have analyzed the content of a trade or technical area on the basis of industrial practice. With content established, we have endeavored to teach the trade with method copied from the academic area. Finally, we have evaluated our work in terms of successful student placement.

We need studies which analyze and define the pedagogy being applied in these classes. With controlled groups, we should set up programs to study whether these or other methods best accomplish our aims.

2. In applying our analysis of content in various trade areas to curriculum, we have tended to make our course content as broad as possible to avoid important omissions. In so doing we may have extended our offering beyond the content required by the worker in a specific area. We need to make studies in depth to determine as precisely as possible what is really needed and to tailor our courses accordingly.

3. We have cooperated in many ways with industry in an effort to establish curriculum and course content that is in accord with industry's needs. But we have not yet learned how to measure the effectiveness of our training as it is reflected in the work of our graduates. Instruments should be devised which would enable us to test our programs against the evaluation of industrial supervisors.

4. Programmed learning should be given some attention with a view to determining whether parts of all specific courses might bene-

fit by programming. The possibilities here for training, re-training, home study, or as a supplement to speed up the process of training should be investigated.

5. The wide variation in work-experience requirements for T and I instructors in different states suggests the need for study to determine whether the instructor with nine years work experience is a better teacher than the one with three.

6. For those of us who have been involved in the training of boys in the use of basic machinery, the constantly reiterated criticism that automation and industrial change have made this a senseless procedure is particularly galling. However, if we are to be able to refute these claims, we need more than our own knowledge of the nature of machines. We need studies which will prove or disprove our contention that the man trained in the structure, operation, and maintenance of machinery is adaptable to change.

7. For years we have attempted to side-step responsibility for training the academically handicapped. Our traditional courses have not been suited to their needs. We find ourselves now firmly committed to this group. Yet we have no research basis for determining what areas or course content would be best suited to their potential as students and workers. The programs provided for this group must be "special" but not necessarily in the area of "special education." Neither should they necessarily be of high-school graduate level. These are problems which would ideally have been solved before we opened our first classes for this group. We will be on uncertain ground until we have some statistics to support whatever action we decide to take.

Additionally, the teacher to be used with the academically handicapped will need special qualifications which are still unknown.

Our need then is clearly two-fold. We need broad studies to support or refute the generalizing which is popular among both our own people and our detractors. We need depth studies of specific problems, many of which are peculiar to only one of the vocational education services. We need studies of programs and of people.

Recommendations

It should be clear from what has been said that it is my opinion that there is no facet of Trade and Industrial education which is adequately covered by existing literature. Even if one or more books in each area suitable for use as texts in teacher education courses were in process of publication at this moment, the supply would not be adequate. With this in mind, I make the following recommendations.

1. Texts for use in the areas of vocational philosophy, industrial and public relations, coordination, and cooperative training

should be written by men who are a part of vocational education. In the last twenty or thirty years a whole new generation of men have made vocational education the focal point of their lives. Many of them have come up through the ranks, with experience at every important level. Many of them are literate and articulate. All of them are extremely busy. Some means must be found to encourage this group to produce the books which they are peculiarly fitted to write.

2. Texts should be short, direct, and confined to one topic. Something in the nature of a monograph in form and physical size probably would be the most useful. If the course is philosophy, we need books whose subject matter is philosophy, not history, practice, and method combined in one enormous volume. Incidentally, space could well be saved by a gentleman's agreement that each new book would not open with a hundred page repetition of the story of manual training and the development of the vocational movement in the United States. Let us propose to any interested publishers that the readers of our new books already know this story or will acquire it from volumes specifically designed to convey these aspects of the story.

3. Our texts should be completely divorced from industrial arts. The vocational education movement is not an outgrowth of industrial arts. The two areas have no practical connection. They are based upon separate philosophies. It should no longer be necessary even to explain these facts in our literature.

4. Once we have acquired a body of newly-written literature, we must keep it up to date wherever up-dating is applicable. Nothing is so suspect to the student as a text that is too old to include developments whose effects can already be seen.

5. Ours if a field large enough to support more than one new text in each area. There are thousands of T and I teachers constantly under training in colleges and universities, in branches, and in extension centers. We could guarantee a fair market for authoritative works.

Summary

A good textbook furnishes a focal point for discussion. It sharpens the appetite of the student for further study and insight into the possible applications of the principles which the book sets forth. It provides the teacher with an outside authority to support or contradict the theories which he is advancing. It is no substitute for wide-range reading on the part of the student or for study of his own problems; but there is no substitute for a really good text.

Having produced no books of my own, I now find myself in the position of the professor who, introducing his course with an apology for the shortcomings of the prescribed text, remarks, "This text isn't very good, but we'll just have to use it until my book is published."

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With a few exceptions, the books on the Ohio reference list relating to the areas covered in this paper were examined with a view to determining copyright date, qualification of authors to write on vocational education, pertinency of textual material, length, style and clarity of writing. Additionally, such effort as was possible in this short period of time was made to discover any new publications. Publishers were not contacted. This may be considered a serious weakness if a substantial number of new titles are in process of publication or have not yet reached any of the vocational education offices which were consulted. Most T and I people merely shook their heads when asked to recommend new nationally distributed materials.

Works with copyright dates previous to 1940 were excluded from this list as were works in general education or those specifically written for the industrial field.

Principles, Practices, History, Philosophy

Current or Revised

U. S. Department of Health, Education, and Welfare. *Education for a Changing World of Work*. Report of the Panel of Consultants on Vocational Education. Washington, D. C.: U. S. Government Printing Office, 1963.

Invaluable source material for any course in T and I. It might be hoped that the statistical material contained in the report would be kept up to date by revisions.

Hawkins, Layton S., Prosser, Charles A., and Wright, John C. *Development of Federal Legislation for Vocational Education*. Compiled by J. Chester Swanson. Prepared for the Panel of Consultants on Vocational Education, U. S. Department of Health, Education, and Welfare. Chicago: American Technical Society, 1962.

An effective course in federal legislation does not have to be dull or dry. It can be tremendously exciting to students to be led to see the possibilities for program development under the laws. This book, with the addition of a concise chapter on developments since 1962, will do well as a source book and has been used by many of us as the only available text. It may be that the subject is so topical that no interpretive text could ever be kept up to date, but an effort should be made to produce one.

Roberts, Roy W. *Vocational and Practical Arts Education*. New York: Harper and Row, 1965.

While this book is attractive in form and well written, it is typical of the omnibus type of book which has had to serve us for so many years.

Venn, Grant. Man, Education, and Work. Post Secondary Vocational and Technical Education. Washington, D. C.: American Council on Education, 1964.

Following some heady praise for the idea of vocational education, the author reduces the high school T and I programs to somewhat less than nothing with sweeping generalizations about their inadequacies. A very frustrating book. Certainly not suitable as a text, but good source material in part.

National Society for Secondary Education. Vocational Education. The 64th Yearbook of the National Society for the Study of Education. Part I. Edited by Melvin L. Barlow. Chicago: National Society for Secondary Education, 1965.

An excellent source book of articles relating to principles and philosophy of vocational education. Most of the contributors are active and nationally known. Those in other fields are reasonably-to-well informed. Most of the articles could be profitably used in various courses in vocational education.

Note: A study of bibliography in new or revised books is enlightening. Those references which are in our field are largely the old books, journal articles, and government publications.

Classic But Out-Of-Date

Hawkins, Layton S., Prosser, Charles A., Wright, John C. Development of Vocational Education. Chicago: American Technical Society, 1951.

These three men were "involved" with the development of vocational education as none of us have been privileged to be. Their personal knowledge, added to extensive research, has made this book a classic which anyone would be foolish to try to reproduce.

A volume devoted to a complete but more general history of vocational education might provide a better text, with this book reserved for reference for details.

McCarthy, John A. Vocational Education: America's Greatest Resource. Chicago: American Technical Society, 1950.

Chapters 1-6 are useful although repetitive of some of the other histories. Chapter 6, "What Constitutes a Good Program," is excellent. The book is too long and too old.

Mays, Arthur B. Principles and Practices of Vocational Education. New York: McGraw-Hill Book Company, Inc., 1948.

This book attempted to cover "all vocational education," including the highest skill professions. Both its age and this approach lessen its value for the public school vocational educator.

Prosser, Charles A., and Quigley, Thomas H. Vocational Education in a Democracy. Chicago: American Technical Society, 1949.

Our older books have a common weakness -- they must refer to vocational education as it was at the date of writing. Much still-pertinent generalizing is done; but it is done on the basis of the pre-1949 situation.

Struck, F. Theodore. Vocational Education for a Changing World. New York: John Wiley and Sons, Inc., 1945.
Classic and out of date.

Others

Byram, Harold and Wenrich, Ralph. Vocational Education and Practical Arts in the Community School. New York: The Macmillan Company, 1956.
As the title indicates, this book mixes the two areas of vocational education and industrial arts. There is some good material on inter-service cooperation, cooperative programs, and community participation. The print is small. The book is lengthy.

National Manpower Council. A Policy for Skilled Manpower. New York: Columbia University Press, 1954.
Chapter VI, "Issues in Vocational Education," is well worth reading by potential teachers. It, of course, reflects the thinking of the 1954 period.

National Manpower Council. Improving the Work Skills of the Nation. New York: Columbia University Press, 1955.
This book is included for the controversial nature of Chapters 3 and 5. Chapter 5, a conference discussion, will enlighten students on the conflicting ideas about vocational education expressed by many people outside the field, who base their opinions upon knowledge - or lack thereof - of local situations.

Shop Planning

A text for shop planning needs to start with curriculum planning and with determination of current needs or requirements of industry. When these preliminary decisions have been made, we need to plan a facility which will make it possible to offer the training required, concentrating upon the basics of the trade. Curriculum planning must precede shop planning.

The only materials widely available are the shop-planning manuals, which should be used in the last portion of a shop-planning course, if they are used at all. It is not our function as shop teachers or vocational education administrators to draw plans for the physical plant. We need to prepare educational specifications as a guide to the architect. There are numerous manuals, state-level and nationally circulated, all of which follow the format of presenting shop diagrams and equipment lists. None of them could serve as a text for an adequate course in shop planning.

William K. Dunton, well-known in the field, has a book in process of publication.

Prakken Publications, Inc. *Modern School Shop Planning*. Ann Arbor: Prakken Publications, Inc., 1961.

Walker Turner. *School Shop Planning Manual*.
There are manuals available like this Walker Turner manual which have templates to be cut out and used for planning.

The University of Texas. *School Shop Layouts and Equipment*. Austin: Division of Extension, Industrial Education Department.
Equipment lists and shop layout designs. Limited application to a good course.

Weaver, Gilbert C. *Shop Organization and Management for Vocational and Industrial Arts Teachers*. New York: Pitman Publishing Corporation, 1955.
A sound little book, somewhat uninteresting in format, with many pages of lists, which the author says stimulate thinking. He includes the idea of curriculum planning as prerequisite to space and equipment planning, but puts no stress on it. Not recommended as a text. Possible reference.

Public and Industrial Relations

The areas of "Public and Industrial Relations" in vocational education badly need definition. Courses in these areas are taught under the guise of everything from how to make a speech to how to negotiate with a labor union. We are all aware of the tremendous volume of material available for use in the training of public relations and industrial and labor relations specialists. But to my knowledge, there is no written text for T & I about the problems encountered by local directors, coordinators, and teachers. Most of the histories and general works, plus many of the books on method, have chapters or sections devoted to good publicity and to community relations. None is adequate as a text.

DEVELOPMENT OF TECHNICAL TRAINING,
TEACHER TRAINING,
AND SCHOOL ADMINISTRATION PROCEDURES
IN THE U. S. NAVY

by

James F. Peterman*

Before I begin to tell you of the evolution of procedures bringing about current practices in technical training, teacher training, and school administration in the Navy, I would like to thank you all for the opportunity to address you. It has been quite some time since I have had the privilege to hear as many fine presentations, covering as broad a scope, with the varying philosophies, as I have heard here in the last several days. While our work in the Navy does not exactly parallel that in college, university, and vocational teacher training institutions, our end objective of highly qualified training personnel is the same.

To begin the development of present day procedures, I'd like to take you back to 1939. The world was in turmoil; Hitler was beginning his take-over of countries in eastern Europe; fortifications were being built by nations not yet involved in the coming great conflict; the United States was coming out of the great depression of the thirties, and the United States Navy was a rather dormant, obsolete, and thinly deployed force of about 325,000 officers and men who were doing the best they could with equipment and ships built mostly during and shortly after World War I.

I won't dwell long on the rapid developments of the years between 1939 and 1942. In 1942, however, the Navy and the other armed forces of the United States, as well as most nations of the world, were involved in the second war to end all wars. The rapid build-up of manpower and the tremendous output of our production machine provided the Navy with many thousands of ships and planes of all shapes and sizes. All these ships and planes had to be manned with trained personnel capable of doing a job against an enemy who was, perhaps in the early stages of the conflict, better prepared.

Prior to World War II, the Navy had seen its formal technical schools diminish in size. Most training took place aboard ship or on stations in an on-the-job training situation. Promotions and advancement in rating were desperately slow. Trained teachers, for formal classroom or laboratory instruction, to teach all the required subjects, were not available in the nucleus of 325,000 experienced sailors in the now 2,000,000 man Navy. American ingenuity, imagination, and use of all facilities available met the challenge and provided the basic knowledges and skills in adequate numbers of men, to man and maintain the battle equipment of growing technical complexity.

I am certain that my own experiences during the immediate pre-war

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period closely parallel those of some of you in this group. For several reasons I had taken a teaching position in a Wisconsin community prior to graduation from college. I was running short of money for education, had received about all the help available from home, and there was even at that time, a shortage of technically trained industrial arts teachers. When a job opportunity presented itself--I took it. This experience lasted for about a year during which time the attack on Pearl Harbor and our entry into World War II took place. In January, 1942, the State Board of Vocational Education in Illinois was hiring qualified sheet metal and welding instructors to work at the Navy Pier in Chicago. I was interested, applied, and was accepted. This was a rather typical situation in which qualified instructors were hired by an activity to provide Navy training in leased or rented facilities on a contract basis. Few regular Navy personnel participated in these training programs. Most participants were civilians and Naval Reserves with a smattering of recalled fleet reservists to advise and supervise. Curricula, instructional materials, training aids and objectives during the early stages were largely locally prepared with little coordination with other areas related to accomplishing a similar job or training similar skills.

One instructor-supervisor relationship I experienced seemed routine for the time and rather reflected our organizational preparation and capacity. As an aviation metalsmith, I was teaching aircraft maintenance and repair skills involving some of the recently developed metals used in aircraft construction. I had a student ask a question I couldn't answer and decided to ask my supervising chief, a recalled fleet reserve, for help. When I arrived in his office, he was seated, as usual, in his swivel chair. I asked the question; he leaned back and replied in a very blunt manner, "Son, go look it up in a book like I'd have to do." While this was perhaps not a universal situation, supervisory practices left much to be desired, most teacher improvement was self-improvement, and much initial instruction was by trial and error. Some of the educators in positions of responsibility recognized shortcomings and communicated with management bureau personnel concerning these shortcomings. These communications and other recommendations over the next several years led to the establishment of a Training Branch in the Bureau of Naval Personnel. Some of the individuals who were planners during the war remained as civilians in the Training Division after the war.

One of the greatest problems encountered during the war was to get qualified instructors in the required quantity. The job requirements of specific ratings were not precisely enough documented, and the newly created ratings were growing like "Topsy" with the continuing technological development of equipment. In many cases, there was no civilian counterpart. The Navy's solutions to these problems were achieved through a series of developments immediately following World War II.

A research contract was let to determine the most advantageous organization for the Training Division of the Bureau of Naval Personnel. Qualified individuals with fitting abilities were hired to fill the established billets and to make the Navy's training effort more efficient. Fact finding and problem solving committees determined that several elements were required: teachers had to be trained; rating responsibilities had to be defined; men had to be trained in technical skills, and advancement in rating had to be timely and equitable.

Between 1947 and 1949, the Manual of Qualifications for Advancement in Rating, NAVPERS 18068, was prepared. This manual specifically lists all the military and professional knowledges and skills required for qualification and advancement to each of the respective pay grades in all of the Navy ratings. Promulgation of this manual provided the ground rules for the effort of the Naval Examining Center which was established in Norfolk, Virginia, in early 1949.

The mission of the Naval Examining Center is to prepare discriminating advancement examinations for all enlisted personnel in the Navy. For the first time, the Navy was able to select with some validity those men to be advanced in rating. Throughout World War II, control of men in various ratings and pay grades created a very serious problem. No Navy-wide system of advancement was in being. Each unit under its commanding officer had an allowance by numbers and pay grade. When a chief petty officer was transferred and no chief was on board or ordered in as a replacement, the created vacancy was filled from within the ranks. When only one man was available to fill the vacancy, a locally prepared test would be administered, the individual certified as qualified, and a new chief petty officer would be rated. Generally this was but a formality and seldom did an individual fail to pass the test. If he did, a reexamination would take place after a short time was allowed for intensive directed study. If more than one individual was eligible for the created vacancy, a problem existed that had to be resolved at the Command level. Occasionally favoritism crept into the selection of the individual. As a result of advancements of this type, at the end of World War II, the Navy was top heavy with high rated petty officers. A pyramid of pay grades in many ratings did not exist. During the latter forties, the numbers of petty officers required in each pay was determined. A period of slow promotion and selection of only the most highly qualified people in limited numbers, as determined by Navy-wide competitive examinations, was a source of frustration for many fine technicians. But a pyramid was developed within the allowance and rating structure for each of the Navy's ratings with the most qualified people finally assuming their rightful position at the top.

Another large stride in the training effort was taken in 1948 when the first of three BUPERS managed Instructor Training Schools was established at the Service School Command, San Diego, California. A second Instructor Training School was established at the Naval Station, Norfolk, Virginia, in 1949, at the same time that the Naval Examining Center was going through the throes of development across the street. The objectives of the BUPERS Instructor Training Schools were to unify an instructor training effort begun earlier at local command and district levels, and to provide schools with qualified instructors possessing more known and practiced teaching skills and techniques. The aforementioned Manual of Qualifications for Advancement in Rating provides the Navy with a huge advantage over a civilian teacher training activity in that the knowledge and skill of an individual in any given pay grade in any rating can be very accurately estimated. To provide highly qualified instructors, the Navy does not need to train individuals in subject matter but may stress techniques and methods. Too frequently, even today after the strides taken by public and private education during the last decade, instructors/teachers are not masters of their subject matter. Navy petty officers by being masters of subject matter at given levels according to pay grade, can be trained to be highly effective instructors during our basic four-week course. Granted four weeks is a short time to prepare an instructor, but the spirit of competition is keen, and the motivation for instructor duty is generally high, since a tour of duty as an instructor usually means a three-year tour of shore duty.

Shortly after the achievement of the objectives of establishing a system of equitable advancement, and after implementing a uniform course of instructor training, the Navy again experienced an opportunity to put these recent implementations to the test. This came during the military build-up during the Korean conflict. At least now the Navy was more self-reliant in providing qualified instructors to teach courses of growing complexity. During this period, I had the opportunity to serve as a battalion commander, and finally as a technical training officer in Recruit Training Command at Great Lakes, Illinois.

It was obvious from the number of ships reactivated and from the number of men trained that the Navy had taken advantage of the years between conflicts to grow and improve in the training area. Though the manpower build-up was not as remarkable as during World War II, a sizable requirement for trained personnel was created. This requirement was met almost entirely by training conducted in Navy schools with Navy instructors and administrators. The level of training, however, wasn't markedly different from that provided five years earlier.

After cessation of hostilities in Korea in 1953, the Navy during the next decade, probably made the most significant technological advancements in its history. Nuclear power was harnessed for propulsion; guided missiles were developed and installed on newly designed and built men-o-war; the Polaris program was conceived and completed with the deployment of a number of Polaris submarines; and a submarine cruised under the Polar ice cap for the first time. These revolutionary developments had their ramifications throughout the Navy. A training requirement for more and greater skills than ever before now existed.

The opportunity for a young man to grow into the knowledge required to perform the tasks of his technical specialty no longer existed. In 1943 for instance, a young seaman or third class petty officer who operated and maintained an SO-1 radar set could learn his job in several months. The old SO-1 radar was installed perhaps on a majority of ships in the fleet. As technology advanced, these men that enlisted when the first radar was developed, had the opportunity to grow in knowledge and experience along with the complexity of design of the equipment they maintained. Now in 1966, most of the young men who enlisted in 1942 to 1946 and had this growth opportunity throughout their careers are retired petty officers and officers. A young man now undertaking a career as a technician is confronted with not one radar set but many different types for many different purposes. His challenge is greater and his requirement for deeper understanding more immediate.

As a solution to the problem of increasing technological complexity, in the middle fifties the Navy once again set out to improve the training program. The plateau of the latter forties and early fifties was no longer adequate. Instruction had to be improved. Areas in training which could most likely be improved that were not yet fully exploited were classroom supervision and school administration. As a result of this effort, a School Administrator's course and strengthened in-service training programs to improve both instructor competence and technical ability were implemented. At about this time, a strong program of school evaluation to examine local procedures in the areas of management, supervision and teaching techniques, was instituted at the Service School Command, Great Lakes, Illinois. This program was planned and executed by our three civilians. Mr. O. P. Baker, Mr. T. S. Holmes, and I would personally evaluate each of our 400 classroom instructors and discuss management and supervisory practices with each of our Officers in Charge in each of the twenty some schools. Results of these evaluations pointed up areas that required attention. Written reports were submitted and recommendations and comments listed. Implementation of recommendations, however, was another matter. The climate was not quite right for a strong program of administrative evaluation. As one of my bosses once told me during the early stages of this evaluation effort, "Missionary work is slow." Despite frustrations from lack of ability in implementing recommended action, annual evaluations were continued. Rapport was developed, confidence built, and continuing recommendations were made. Eventually, when more highly trained administrators were functioning in management roles, gradual implementation of recommendations began to pay dividends. Instructional materials were more uniformly prepared, proofread, and reproduced. Curricula were periodically screened, reviewed, and updated. Tests were standardized, difficulty and discrimination qualities of items were determined, and the entire training program took on more uniformity and sophistication. In time, classroom as well as general school evaluations were anticipated and welcomed. The teachers taught better, the supervisors supervised more, and a feeling of greater accomplishment and more personal satisfaction became more evident in day to day school operation.

After these refinements were incorporated, a closed circuit television system was installed for teaching selected subjects in basic electricity and electronics; research studies were performed to determine the best methods of instruction; and several teaching machines with simple programs were tested for effectiveness. Programmed instruction was now upon us, and a writing team was established to produce written programs in selected areas.

This is the present state of the art in our Command at Great Lakes. The future no doubt will have Computer Assisted Instruction and other innovations yet to be developed. Regardless of the impact of increasing technical complexity, I believe that initiative, imagination, and a strong and continuing program to train better instructors, more qualified supervisors, and capable school administrators will enable us in technical training to meet the needs of our Navy. It is our belief at Service School Command, Great Lakes, that the success of our training depends on the success and output of our Instructor Training School.

This concludes a general overview of Navy training evolution. In the time remaining, I'd like to tell you more specifically about the Service School Command, Great Lakes, Illinois, and where we fit into the total Navy training picture.

I have known the Service School Command, Great Lakes, Illinois, intimately since January, 1955. It is one of three Service School Commands presently managed by our parent bureau. Our management boss is the Assistant Chief of Naval Personnel for Education and Training. Other Service School Commands are located in San Diego, California, and Bainbridge, Maryland. Naval School Commands, so-called because of a different administrative organization, are located at Treasure Island, San Francisco, California, Norfolk, Virginia, and at Newport, Rhode Island. Our Command at Great Lakes is the largest and most diversified. It provides approximately 25 percent of all enlisted technical training in the surface ratings under the control of our management bureau.

The mission of Service School Command is: "To administer those schools assigned to the Service School Command by the Chief of Naval Personnel which train selected officer and enlisted personnel, including the Naval Reserve, in order to prepare them for early usefulness afloat in their designated specialty and to supplement training afloat by providing advanced and/or specialized training when such training can be more advantageously given ashore."

In carrying out its mission, the Service School Command performs the following functional tasks:

1. Establishes, organizes, and administers within the Command, those schools and courses prescribed by the Chief of Naval Personnel.

2. Provides existing courses or specially tailored adaptations thereof as directed by the Chief of Naval Personnel, to meet the training requirements of the Navy, and to the degree necessary, of the Marine Corps, Army, Air Force, and Coast Guard personnel, and of foreign nationals under the Military Assistance Program.

3. Furnishes suitable instruction for Naval Reservists on annual training duty, with particular emphasis on the accomplishment of practical factor qualifications for advancement in rating.

4. Implements and administers the prescribed curricula and evaluates such curricula in the light of experience and new developments, and recommends changes to the Chief of Naval Personnel in accordance with the changing requirements of the Navy.

5. Provides through continuous guidance and in-service training, a program to improve the methods and standards of instruction in the Service School Command.

6. Conducts a continuous program of evaluation of classroom instruction to assist instructors in achieving the greatest possible effectiveness in their teaching.

7. Maintains close contact with modern educational methods and techniques for the purpose of utilizing those which are adaptable to the schools of the Service School Command.

8. Promotes and practices maximum economy of funds and personnel consistent with the accomplishment of the assigned mission.

9. Maintains close liaison with those activities responsible for furnishing logistic and operational support for the various schools and departments of the Service School Command.

10. Refers requests of special project, study, or service nature to the Chief of Naval Personnel for prior approval.

At the present time, our Command consists of twenty-three different Class "A," "B," "C," and Officers' Schools offering approximately ninety courses. Definitions of schools are as follows:

"A" School: Provides the basic technical knowledges and skills required to prepare for the lower petty officer rates.

"B" School: Provides the advanced technical knowledges and skills required for qualification and advancement to first class and chief petty officer.

"C" School: Provides training in a particular skill or on a particular equipment.

To perform instructional tasks, we have a staff of about 920 instructors, including sixty officer instructors, 800 enlisted petty officer instructors, and sixty civil service instructors that teach in our electronics technicians Class "A" school.

Annually we produce about 21,000 graduates from courses varying in length from two to forty-eight weeks. The average course length is fifteen weeks. On an annual basis, we provide 320,000 student weeks of instruction. Each student week involves a minimum of thirty contact hours of technical classroom or laboratory instruction per week. If our trainees attended classes on a college student basis of sixteen hours per week for thirty-six weeks per year, we would provide training equivalent to an institution with over 16,000 full-time students. Our daily population, however, averages around 8,000 full-time students.

Each Monday a new group of 480 trainees is convened in class, and each Friday a group of 430 graduates is sent to ships or stations throughout the Navy establishment. Attrition for all purposes during the fiscal year 1965 was 9.1 percent. This includes scholastic failures, disciplinary drops, discharges, deaths, etc.

For many of these young men, graduation from a Navy Service School marks their first substantial scholastic accomplishment. Up until recently, only a little over 60 percent of our student input had graduated from high school, and a rather good percentage of these, I believe, were social graduates.

It is my personal belief that the Navy in its training programs is providing at a reasonable cost to us as taxpayers, one of the greatest vocational training opportunities available to young men of our country today. Each year BUPERS managed training programs produce about 60,000 graduates. If these young men who are school graduates, remain in the Navy, they will enjoy a rewarding career. If on the other hand, they decide to return to civilian life, they will perhaps have vocations they can pursue without retraining. They can immediately become contributing members to a society that is already plagued with enough juvenile problems.

We do have the advantage of a military situation. School attendance during the work-week is of course mandatory. A failing student is repeated as long as his attitude is healthy and within reason, until his grades improve. Our philosophy is that we must take maximum advantage of the opportunity to train our most important resource--manpower. Failing students have compulsory night study. Marginal students may take advantage of voluntary night study where lessons of the day are retaught by qualified instructors.

All in all, being a part of the Navy training program is a gratifying experience. We have many fine dedicated people doing an important job for the welfare and defense of our country. If any of you are ever in the Great Lakes area, please give me a call, be my guest, and visit our schools. You'll enjoy it. Thank you.

PART III

INNOVATIVE PROGRAMS AND PRACTICES

TELEVISION RECORDINGS
A NEW DIMENSION IN TEACHER EDUCATION

by

Dwight W. Allen and David B. Young*

The use of television recordings has added a new dimension to the preparation of secondary school teachers at Stanford. Video recordings made in teachers' classrooms and in micro-teaching sessions at the university provide both supervisors and teachers with a common frame of reference for discussing teaching performance.

Development

Several methods have been previously employed to capture a teaching performance so that it could be recreated for the teacher and the supervisor during a critique; audio recordings, 35mm. time lapse photography and motion picture film. Each has served a purpose but does not combine the unique features of video tape.

Prior to the general marketing of portable television recorders in mid-1962, Stanford began tests with pre-production models of the first portable videotape recorders. Preliminary work with the recorder indicated that the equipment could be utilized, and in February 1963, the first portable video recorder delivered to a customer was put into service at Stanford as a part of the experimental teacher education program supported by the Ford Foundation.

The first application of videotape was in a demonstration teaching lesson where a teacher taught a lesson and was able to view it immediately upon completion of her teaching. During the Spring Quarter of 1963 both teacher-interns and experienced teachers were recorded to further test the feasibility of using the recording equipment in the classroom.

Interviews with both the experienced and inexperienced teachers following the preliminary use of video recorders led to the tentative conclusion that the opportunity for teachers to view their own performance was of significant value to them. It also demonstrated that one man could operate the apparatus and that its presence in the class was relatively unobtrusive.

Based on this experience the School of Education was successful in obtaining systematic support for the development of micro-teaching from the Kettering Foundation. Concomitant learning experiments were also begun under grant support from the U. S. Office of Education.

Current Use of Television Recordings

The Stanford program for preparing secondary school teachers consists of paid internships in cooperating schools. In addition to a part-time

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teaching assignment, interns are enrolled in both academic and professional education courses.

The internship is a 12-month program, which begins the summer prior to the regular academic year. The summer program consists of intensive course study and the Micro-Teaching Clinic. Micro-teaching is a scaled teaching encounter in which interns have the opportunity to gain experience in specific technical skills of teaching under intensive supervision. About half of the micro-teaching sessions are videotaped.

Pre-Service Micro-Teaching

An intern's first experience with videotape occurs on the initial day of the Summer Quarter. In the past year, one hundred forty-four interns taught five-minute diagnostic lessons which were recorded on videotape for future comparison. The lesson was chosen by the intern from his own teaching field and taught to a group of four high school students. Immediately following the recording the intern viewed his performance with his supervisor. The supervisory remarks during the diagnostic session are primarily of an encouraging nature. The students also rate teacher performance on a brief teacher competence appraisal form.

During the first three weeks of the micro-teaching clinic interns teach two lessons per week, one of which is recorded on videotape. The intern teaches a lesson and then views the recording with his supervisor. Following this critique period the intern reteaches the lesson which is again recorded, played back, and critiqued. Each time, the intern teaches a different group of students who, in turn, give the teacher feedback in the form of ratings or comments. The last three weeks, interns are grouped as to subject matter areas and cooperatively plan 20-minute lessons. Each intern teaches six of these lessons.

During the last week of the clinic all interns are recorded again following the same procedure as in the diagnostic lesson for comparison with the first-day diagnostic recordings and for future comparison with recordings in their classrooms.

An intern has about fifteen lessons recorded and played back during the summer.

Field Recordings

During September all interns are recorded for the first time in their classrooms in the cooperating schools. Throughout the year a total of eight to fifteen classroom performances and several micro-teaching sessions are recorded. The teachers are advised in advance of the recording and are instructed to proceed with their normal lesson (but to avoid scheduling films or tests on this day).

A single operator rolls the cart into the classroom and places it in the rear of the room during the passing period between classes and readies the equipment for recording. The operator will then record a 20-minute segment of the lesson which has been predetermined by either the teacher or the design for a study. Early in the use of videotape longer recordings were made, but it was found that little additional information was obtained from the relatively longer time, effort and expense required.

Central to the classroom recording procedure is an effort to be unobtrusive to the class and the teacher. This is accomplished by the simplicity of the equipment and the casual operation by a single person as contrasted with a cameraman peering through a view-finder, elaborate microphone set-ups and lighting, multiple cameras and noisy remote controls. Teachers report that the cameraman and equipment are no more disturbing than an observer seated at the rear of the room.

Supervisory Techniques

"I didn't know that I leaned on the blackboard so much." "I'll never put my hands in my pockets again." These are typical remarks following a teacher's first viewing of his performance. However, these "cosmetic" considerations quickly give way to matters of relevance to the teaching act once the teacher has had the opportunity to view himself the second time.

Stanford research finds that various supervisory styles, ranging from a direct to a more heuristic non-directive approach have all resulted in changes in teaching behavior when accompanied by television recordings. The videotape medium offers the supervisor the opportunity to reinforce desirable teaching behavior by simply offering such comments as "That is a good thought-provoking question," "You developed that point particularly well," or he may begin, "Did that point develop as well as you had planned?" To this the intern might reply, "No, the students didn't seem to follow my example on the board." The supervisor would then say, "Let's stop the tape at this point and return to where you first introduced the subject and take a second look at the way you developed it, and at the same time consider how the presentation might be revised."

Keith Acheson, the first coordinator of videotaping at Stanford, concluded in his study of supervisory techniques, with and without the use of videotape, that the addition of television recordings to both direct and indirect styles of supervisory conferences increased the supervisor's ability to change specific teacher behavior as observed in a subsequent recording.

Current Television Recording Studies

Through a grant from the U. S. Office of Education, several studies are currently underway to determine training effects of feedback and modeling procedures in teaching performance.

Data are now being analyzed from a study of the effectiveness of various degrees of supervision. In this study, supervision varied from a teacher viewing his own performance alone to a teacher's viewing his own performance with full supervision. More specifically the treatments were as follows:

1. Teachers viewed their performance alone without specific instructions.
2. Teachers viewed their performance alone but were given detailed written observation procedures and specific suggestions on how to improve their skills.
3. Teachers viewed their performance and received the same written material as above but in addition a supervisor viewed the playback with the teacher, verbally reinforcing them when the recording indicated that they were using the desired teaching behavior.
4. Teachers viewed their performance with the supervisor who was free to use any methods he saw fit in bringing about the desired teaching behavior.

The procedure consisted of a diagnostic recording followed by three consecutive recordings with intervening training sessions using supervisory treatments outlined above.

The second study has been conducted to determine the effect of immediate feedback as compared with delayed playback and accompanying training sessions. All teachers were recorded four times. One group saw their playback the same day they were recorded and were again taped the following day. Another group saw their recording the same day but were not recorded again until seven days later. Still another group did not see their recordings until one week after they were recorded and then were recorded the day following their viewing of the playback. The fourth group was recorded and saw the playback on alternate weeks. All groups were recorded seven weeks from the date of the first recording as a post-test.

A third study was designed to determine the effect on teacher behavior of viewing a model performance on videotape.

Six groups were identified. Teachers in all groups taught three lessons with two training sessions intervening. With two groups as controls, the remaining groups represented various combinations of viewing model performance and their own performance with and without supervision.

The results of the studies will soon be available.

Pilot Programs

Teacher Employment

With the cooperation of the Fremont Union High School District, Sunnyvale, California, Stanford is attempting to determine if a more reliable method can be found to select teachers. Applicants for positions in the district were required to teach a five-minute micro-lesson which was recorded on videotape and rated by high school students and Stanford supervisory personnel. The teacher had the alternative of teaching more than one lesson and indicating which one he would prefer to have as the official record of his performance. Micro-teaching ratings were not used as criteria for employment but will be compared with the normal ratings of the performance of the teachers (employed by conventional methods) at the end of the school year. In this way the use of television recordings and student ratings as selection devices can be contrasted with conventional methods.

Supervision Training

The Campbell Union High School District, San Jose, California, cooperated with Stanford in an appraisal of television recordings as a part of a supervisory training program for the supervision of experienced teachers. Principals in each of the schools of the district selected teachers with whom they wished to work. Twenty-minute recordings were made and played back for the teacher and the principal, and a supervisory conference immediately followed the class. The principal followed up on this supervisory conference with a later visit to the classroom to assess the results. Concurrently, seminars were held at which time personnel from Stanford demonstrated techniques of using television recordings and discussed with the supervisory staff methods of effective appraisal of teacher competence.

Principals and other seminar participants were enthusiastic about the possibilities for using television recordings in supervision as well as for orientation activities and instructional purposes.

The Campbell district has recently purchased a video recording unit and plans to use the equipment in a manner similar to that in the pilot study.

Selected Other Uses of Television Recorders

There are many ways in which television recording equipment can be utilized. New applications are constantly being identified. The following projected uses appear to have considerable merit.

Substitute Teachers

Teachers and administrators alike have expressed dissatisfaction with their experience with substitute teachers. Either too few teachers are available or many of those who are, cannot capably handle a class.

It is proposed that supplemental lessons in each subject matter field be prepared by regular teachers and recorded on videotape. These lessons could then be presented to the class in case of an absenteeism in that particular department. The lesson would probably be 20-30 minutes in length and could be open-ended in nature or end with a specific assignment for which students could do independent research. In either case, a paraprofessional could handle the arrangements and maintain order. The video recordings are quite feasible and the same recordings might be used over a period of several years.

The Stanford School of Education has already made use of this method to pre-record lectures in advance in order that they may be presented to the class on days when professors must be absent from the campus.

Inter and Intra-visitation

Writers on in-service education encourage administrators to provide teachers the opportunity to observe other teachers' performances. However, logistics and other problems have impeded the widespread adoption of such visitations. Also, there exists a question of whether teachers will receive optimum benefit from the experience if they are not directed in their observation. The use of television recordings solves logistics problems and in addition provides the opportunity for a supervisor to view the recording with the teacher and to focus his attention on the desirable teaching behavior.

Instructional

The possibilities for using television as an instructional aid are far too extensive to be discussed in this report. However, portable equipment such as that developed at Stanford, permits the bringing of a "field trip" or an outstanding authority to the classroom with relative ease. The same equipment can be utilized to project demonstrations in biology or chemistry through large monitors so that each member of the class has a front-row seat. The videotape medium has also been used effectively in group and individual counseling.

Senior Staff Supervision

Senior professors do not find time to supervise teachers in training. Such supervision is typically relegated to the most junior members of the staff or to graduate students. Due to more efficient use of staff time by bringing a teacher's performance to the university via videotape, one professor can now critique the performances of several teachers in less time than he could have spent traveling to even one school. In addition a professor might view at one time a series of taped performances of a teacher over several months duration, commenting on relative progress, in addition to regular supervisory comments.

Supervisor Training

The video record is a good stimulus for the training of supervisors. It enables a large group of supervisors to view the same performance and to arrive at a common frame of reference for its evaluation. When disagreement occurs, there is the advantage of being able to replay the episode in question.

A library of video tapes of teaching performances of varying ability in the different disciplines has proven to be valuable in training the novice supervisor.

The long standing difficulty of differences in philosophy between university supervisors and resident supervisors in the local schools where practice teaching or internship takes place can be confronted and at least partially resolved through common viewing of video excerpts. Where differences remain, supervisors can still view the same teaching performances on video tape and arrive at some consensus on how to interpret and use a list of criteria.

Model Teaching Performances

Model teaching performances can be recorded on videotape and viewed by teachers in training. This provides the opportunity to reinforce desirable teaching behaviors as they occur. As it becomes possible to identify more precise behaviors to model, it will be possible to design experiments to test varying uses of models. Such recordings can then be used to demonstrate for novice teachers various technical skills of teaching.

Remote Supervision

The concept of remote supervision permits teachers located in schools remote from supervisors to receive supervision assistance from senior staff. A teacher can have a recording made of his performance and send the tape to the university, state department of education, or district office. A senior supervisor can then view the recording and add supervisory comments on a second sound track of the videotape without erasing the original information. The tape would be returned to the teacher for his viewing and review of the comments.

Other Uses

Plans are currently being formed to use Micro-Teaching Clinic procedures and videotape in the induction of novice college instructors. A split screen which shows simultaneously the teacher closeup from the student point of view and the students from the teacher's view point is currently being developed.

Experience with television recording has indicated its uses are limited only by the educator's imagination and ingenuity.

APPENDIX I

A Description and Cost of Television Recording Equipment as Employed in the Stanford Teacher Education Program

The following criteria governed the development of the portable recording units currently in use at Stanford:

1. The unit must be of such size, weight, and simplicity as to be moveable and operable by a college undergraduate alone and could be placed in the rear of the classroom without moving the furniture in the room.

2. The unit must have the capability to be readied for recording within the customary five-minute class intermission.

3. The operation and set-up of the equipment must be unobtrusive in the classroom.

The equipment is installed in a 30" x 20" x 46" plywood cart mounted on 4" rubber casters. All wiring and connections between the components are completed within the cart. A patch panel is located on the operator's side of the cart to facilitate connections to external components such as microphones and monitors. The front side of the cart (the side facing the teacher) is kept free of any kind of apparatus. The cart is also equipped with a pull-out drawer for extension cords and other supplies. The microphone stand is carried in the cart. All electronic components are secured to the cart and the recorder is mounted on shock absorbers.

Cost of the cart (materials only)	$ 200.00

A MVR 15 video recorder is installed in all of the portable carts. The recorders are manufactured and marketed by Machtronics, Inc., (MVR) Mountain View, California. The MVR 15 records on 1" video tape which passes over the heads at 7-1/2 ips. The recorder has broadcast capabilities and a dual sound track to provide for sound dubbing of supervisory comments if so desired.

Cost of the Recorder	$11,350.00

A General Electric TE 15 vidicon camera is mounted on a manual pan and tilt head, which is in turn mounted on a removable board attached to the top of the cart by the means of two thumb screws.

Cost of the camera	$ 1,650.00
Cost of the pan and tilt head	$ 145.00

The video information is monitored via a Sony Micro-TV Model PVJ 305 RU equipped with a JCO-1 jeep connector which is mounted in the top of the cart. The same unit can also be used to record regular broadcast programs. The monitor is so positioned as to permit the operator to casually follow the camera coverage versus the use of a view finder.

Cost of the Monitor $ 260.00

A single Shure 546 uni-directional microphone fitted with a snap-on attachment is used on a folding microphone stand. This microphone is placed either in the front corner of the room or directly in front of the teacher's desk so that it receives the sound directly from the students and indirectly (off the rear wall) from the teacher.

Cost of the microphone and stand $✓ 120.00

In order to record teachers in a laboratory or outdoors (for example, chemistry and physical education) the cart is equipped with a Vega wireless lavalier microphone and receiver.

Cost of the Vega wireless $ 550.00

A microphone mixer and pre-amplifier is necessary when using the wireless microphone and a stand microphone simultaneously. An Altec 1567A is mounted in the top of the cart for this purpose.

Cost of the Mixer $ 375.00

During the recording sound is monitored by Telex earphones Model No. HFY 91

Cost of the earphones $ 7.50

Playback Equipment

A 25" Conrac monitor (CEA 25/Y) is used for the playback. A monitor of this size is adequate for presentation to large groups as well as for the supervisory conferences. The monitors are mounted in a cart which is designed to lower the monitor to a transport position or raise it for small group viewing.

Cost of the monitor	$ 430.00
Cost of the cart	$ 75.00

The sound is amplified by an Ampex 622 speaker-amplifier which is incorporated in the same cart as the monitor. A remote volume control is located on the cart containing the recorder.

Cost of the speaker $ 189.50

We are currently using Memorex 1" video tape No. 75 P BGL-726 in 2400' lengths with a recording time of 60 minutes. The tape may be used repeatedly.

Cost of tape per roll $ 62.35

The equipment is transported in small trailers built for this purpose. They are equipped with a hinged top and five foot ramp to facilitate loading. The recording and monitor carts are strapped to the front of the trailer during transport.

Cost of the trailer (material only) $ 150.00

The carts are moved up stairs with the aid of a three-wheeled revolving-caster dolly. Due to the "walking" action of the dolly one man can move the carts to upper-floor classrooms.

Cost of the dolly $ 45.00

Recently, a compact van was purchased which is intended primarily for the purpose of transporting the carts and providing transportation for undergraduate operators without automobiles. Also, the truck can be utilized as a playback station by installing a small monitor in the dashboard.

APPENDIX II

Description and Cost of Different Kinds of Television Recording Equipment Employed in the Stanford Teacher Education Program

The advent of lower-cost recorders now makes it possible to develop recording systems for as little $1,300 for micro-teaching, and $2,000 for field recordings. The advantages of television recordings can now be obtained by school districts and colleges without ready access to funds.

Stanford personnel are currently developing two, lower-cost recording systems and appraising their feasibility for teacher education.

Low-Cost System ($2,000)

The Sony TCV 2010 recorder and monitor are the basic components for this system. The home recorder comes equipped with a nine-inch monitor and a camera for $1,295. Cameras other than the Sony camera can be used with minor modifications to both the camera and the recorder. An individual dynamic microphone and preamplifier will complete the system. (See detailed list below.)

Current use of the unit indicates that the quality is acceptable for supervisory sessions between a supervisor and an intern. There is some quality depreciation when attempting to use larger monitors.

Sony Corporation has just recently announced an educational version of the above recorder (SV 300) which will have conventional receptacles and specifications to use regular closed-circuit television components. The recorder will be in a 45-pound case of its own, and the camera and other components can be transported in another case. A similar transportation system is being developed at Stanford by modifying the home recorders.

Plans are being made to develop a low cart which will roll into a station wagon. This unit will also feature an elevator column for the camera and a facility for leaving the camera mounted during transport.

Low-Cost Recording System - Equipment List

Sony TCV 2010 Recorder and Monitor or SV 300 for $1,250	$ 995.00
HV 13 Shibaden TV Camera (modified for Sync from recorder) This camera is also usable with conventional systems.	450.00
GBC Zoom lens 22.5 mm to 90 mm.	295.00
Bogen MX6A Mixer-Preamplifier	40.00
Samson Elevator (7301) and Head (7201)	115.00
Cart and Materials (or suit cases) material only	60.00
Microphone - Electrovoice Cardioid Dynamic-664	60.00
Atlas CS-1 Microphone Stand	22.00

Medium-Priced System

Stanford is also developing a medium priced recording system using a Sony EV 200 1-inch educational recorder. This unit will include an elevator column in the cart for instructional purposes. The height dimension will be decreased to provide for leaving the camera mounted on the cart during transport.

The technical quality produced by the medium-priced system is excellent and nears that of the broadcast equipment. The major difference is that it does not meet broadcast specifications.

Medium-Priced Recording System - Equipment List

Sony EV 200 (Stop and Slow motion + $250)	$3,950.00
General Electric TE 20A Camera	1,595.00
Angenieux Lens 150 mm. to 15 mm. Zoom	800.00
Hercules Elevator and Head	305.00
Cart-materials only	250.00
Sony 5-inch monitor PVJ 3030	215.00
Altec Mixer-Amplifier 1567A	300.00
Altec Compressor Amplifier 436C	165.00
Shure 546 Microphone	135.00
Atlas CS-1 Stand for Microphone	22.50
Telex Headphone	7.50
Sony CR-5 Wireless Microphone	365.00
23" Setchell Carlson Monitor - Receiver - Speaker	250.00
Monitor Cart - Pixmobile TV Table	65.00

Split-Screen Technique

Stanford is currently studying the efficacy of showing both pupils and teacher on the screen simultaneously. A closeup of the teacher is shown in one corner as the pupils view him, and the pupils (entire class) is shown from the teacher's view on the remainder of the screen.

Originally, the split-screen effect was achieved by masking off alternate portions of the front of the vidicon tube of two cameras with common sync. The latter was accomplished by driving the second camera with the first.

Recently, a special effects generator has been purchased to study further in a more sophisticated manner this technique in teacher education. The special effect generator provides the opportunity to split the screen vertically and horizontally and to vary the dimensions of the halves electronically. It is also possible to use the corner inset and vary the size electronically during the recording as in the split half configurations.

It is not advocated that the split-screen recording replace the conventional method as depicted in the body of this paper. This special technique has been developed as a supplement. Pilot work has been done in studying the attending behavior of the class and individual pupils in the context of the total class. With the split screen the attending behavior changes can be related to the performance of the teacher at any time throughout the class period. It should also be noted that with the split-screen technique several levels of information are available with one initial set-up taking approximately seven minutes. For example, show students only - no sound; students only with sound; teacher and students; teacher only, etc. These variations can be achieved either by recording on the tape as listed or by recording all the information on the tape and covering a portion of the monitor as desired during playback.

FLEXIBLE SCHEDULING

by

Dwight W. Allen*

Our Flexible Scheduling Project started about seven years ago when we were trying to make some curriculum innovations. Every time we would attempt some innovation, people would say, "That idea is very fine, but you can't schedule it." We heard that answer so often we finally got mad and said, "Well, okay, what can be done to schedules?" We began to do some fine things. We went down to IBM and said, "Can you schedule things of this type for us on a computer?" A man was sent to work with us, and he told us they could schedule by computer as soon as they were told exactly what we wanted scheduled, and therein lies a story.

We went to the Naval Postgraduate School where they had been doing some computer scheduling research for about three years. Then it got into a "cloak and dagger" kind of story. We heard that someone in Tennessee had solved scheduling problem, but as soon as he had solved it, he went into the C. I. A. and had not been heard from since. Then we heard that IBM in England had solved the problem. We wrote to them, and they wrote back and said, "Yes, we have solved the time-tabling problem (as they called it), and we will soon put you in touch with the person in our office who has solved it." About six months later, they wrote that everybody thought everyone else had solved it and that they really had nothing new. About that time, Austin, French, and Hull, who had written an authoritative book on school administration, came out with a new edition saying that computer scheduling was impossible; therefore, there was no reason to talk about it. This was not very encouraging to our project, but due to the creativity of an industrial engineer, Bob Oakford, with whom we had been working, we were able to get a school scheduling system by computer to work. The first year we scheduled four schools, and the second year we scheduled twenty schools. This year we are scheduling thirty-three schools, and next year we will have about fifty-five schools. We could have several times that number at each stage of the way, but our staff has not been large enough to provide service at that level.

Two years ago, we began looking at applications of the scheduling technology to various specific subject area fields. For example, this next weekend we will have a conference at Stanford on flexibility in foreign languages and implications of flexible scheduling for foreign languages. We have been looking at various subject fields in this way. Recently, we decided to see if we could make major applications of the scheduling technology to the problems of vocational education. Vocational education has been both the darling and the devil of school scheduling, at least in our experience, since many people have looked longingly

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at that three-hour time block which it has. Other people, of course, look at it with daggers in their eyes because of what it does to the rest of the school program. Since we had a rather substantially different approach to the construction of a school program, it seemed to us that vocational education is a very important area in which to focus, to ask some questions, and to seek some alternatives that had not been considered before. Again, we frankly admitted that at that time we were complete novices in the area of vocational education. I must confess that when I first started, I did not know the difference between vocational education and industrial arts, and this was something I got straightened out in a hurry. But there is a great deal that I do not know about vocational education which is a real disadvantage. On the other hand, there are some aspects of this which have led us to be a little bit rash in ways that we were talking about. I hope that over a period of time this will result in progress in terms of defining and re-defining some of the major elements of vocational education insofar as the scheduling is concerned.

Let me take some time to discuss some of the basic notions of our flexible scheduling project--not only as they apply to vocational education, but also as they apply to the total curriculum. I want to focus on the total curriculum in my brief statement this morning because I want to make it clear that the embarrassing questions I ask are not asked just of vocational education. You may become misled if I raise questions only about vocational education because that would simply sound like a conventional diatribe. I will be more generous in my comments than to talk exclusively about vocational education. Instead, I will try to keep vocational education in proper context in my remarks.

We start in this matter of flexible scheduling with what we call a performance curriculum. This is nothing new to you. Vocational education has, perhaps, been ahead of the other areas in the school curriculum in terms of its concern for performance elements and precise performance definitions. A performance curriculum is simply organized so that the task to be learned is defined in terms of levels of achievement. Again, this is nothing new because achievement is like mother, apple pie, and the flag--everybody is in favor of it. You will not find anyone disagreeing on the desirability of achievement. These discreet levels of achievement are time independent, and here is where vocational education comes back to some of the same difficulties that we have in other parts of the curriculum. I would submit that time, like teachers or materials or facilities, is a performance resource that should not in itself be considered as a measure of achievement. In other words, just because he sat through a certain number of hours of a training program, it does not mean that a teacher automatically has certain kinds of competence, or that he has achieved a certain amount. It is that achievement is so hard to define that we sometimes retreat to an easily countable kind of thing to substitute for a more precise knowledge of achievement. If you think of it this way, a performance curriculum provides a comprehensive rationale for innovation.

There are many things on the horizon--team teaching, flexible scheduling, programmed learning, and non-graded programs--which run the gamut of educational innovation. In fact, innovation is the watchword; it is the darling of the educational profession; everybody wants to innovate. It seems to me that the difficulty is that innovation per se is neither good, bad, nor indifferent; and furthermore, no one type of innovation is monolithic in terms of being good, bad, or indifferent. In other words, I could show you team teaching that is great, and I could show you team teaching that is atrocious. I can show you team teaching that is successful in everything except learning. Problems arise when teachers do not get along with each other. I do not care how competent the teachers are, or whether the time that they have is right, or the facilities are right--if they do not get along, they are not going to provide much opportunity for learning. We do tend to think of these things in terms of monolithics, that is, one is in favor of team teaching, or he is against it.

On second thought, this may not be a desirable approach to this subject. Probably we should continue to clarify the concept of performance curriculum and get a firmer understanding of what we are trying to accomplish by way of performance. Then we can come back and say, "What kind of team teaching arrangements might be scheduled to fit this situation, and how might programmed learning contribute?"

I think it is important to look at the process of innovation itself. As we have viewed the process of innovation in education, we have tended, by and large, to think of single-step innovation. We go "plunk," and say, "I have had my innovation like I have had my dose of salts!" You see this in the SMSG program and in the new science curriculum; you see this this coming up in projects in English; you see this in the thinking of principals who say, "I have team teaching in my school," and usually it is only a little innoculation that tends to make them immune. Most of the principals really do not have much programmed instruction at all, but they have enough so that they think they have it. This same notion is true in team teaching because principals think they have already tried it. This is a great temptation and one of the most severe limitations to innovation. It is not the person who says, "I reject it," that you have to worry about--it is the person who says, "Oh, that is just the same old thing we have been doing for twenty years, there is nothing new there." The latter is the really critical situation which keeps innovation from getting very far because people look at something and try to interpret it in terms of the familiar terms. I heard a little bit of that yesterday, if you will excuse my saying so. When I introduced the notion of differentiated staff, you said, "Well, this guy is like the student foreman, and this guy is like this, and this guy is like that." I do not disagree--it may be like that; but it also may be that there are some different notions in there too, or some additional notions. Do you see the point that I am trying to make? It is not that I am trying to say that everything that comes along the pike is brand new, but I think we have to be very careful not to dismiss something too easily, simply because there are elements in it that look like something which is old and tried, or that look like something else.

Innovation is a very important thing, and in education we tend to think of single-step innovation. Whereas we have had an innovation, it seems to me that innovation has to be thought of as an open-ended process. We can never look forward to "The Innovation," but we can think of the current range of alternatives as being unimportant. I sincerely mean it when I say it really does not make any difference whether someone is working on flexible scheduling, team teaching, some non-graded programs, or any of the other specific innovations. The critical question to ask is, "Is your staff prepared to deal with new alternatives as they are identified?" In other words, if something new comes along the road, is this something that can be routinely considered, implemented, tested, tried, and discarded or replaced; or is this something that is a "big deal?" When an innovation comes along, if it is a "big deal" to get it tried, this is the critical flap as far as I am concerned. It is much more critical than whether you have or do not have any one of the current brains. By and large, I think in education (in the whole structure of the schools, in teacher training, and in the whole business), this is our critical lack--we are not tooled up to look at new things as they come along, to try them out routinely and take them in our stride. I have seen, time and time again, educational organizations going through a big ordeal for some dizzy little jump that actually comes out at the other end. Let me be non-charitable and say that too often we do the same little things with a new sign over the door. I think the critical thing we have to decide here is, "Are we prepared to deal with alternatives as they are identified?"

If I may borrow an analogy with the airline industry, we are somewhat in the situation of a DC-3 curriculum, with DC-3 teachers and DC-3 facilities. As I go around to various schools and talk about new facilities, I find some terrible things happening. For example, conversations usually start off with, "We would like the most modern and fantastic facility you can turn out for us, but it must be immediately convertible to a traditional program if these new things do not work." That is like the airlines saying, "We want the finest, most modern, up-to-date, supersonic jet, but it must be immediately convertible to a DC-3 if it does not pan out."

We are building school facilities that are basically like those of the Nineteenth Century, and we just play with the chrome. For example, if the school was built in the forties, it most likely has a skylight in the roof somewhere because that was the big rage in the forties. Unfortunately, they are still building some schools with skylights, and it has been demonstrated that they may give you more problems than benefits. If your school was built in the fifties, there will be some moveable walls somewhere because moveable partitions are the spirit of the fifties. If it is built in the sixties, it must have a carpet on the floor because no self-respecting school is complete without carpeting. However, we still have basically the same "chicken hawk" eighth grade approach to the school--that is, we have some very strange things.

Let me interrupt myself to tell you a story. When I taught mathematics and social studies in high school, I went to the principal one day and said, "I would like to have one of these double blackboards--the ones that go up and down." I thought that this type of blackboard would be helpful to me in trying some of the things I wanted to do. Incidentally, this was about ten years ago. The principal said, "You cannot have one of those blackboards." When I asked, "Why?", he said, "Because they are science blackboards." I said, "I think it would be quite useful." He showed me the catalog, and they were called "science blackboards," double ones that go up and down. In the modern school where the ceiling is not high enough for them to go up and down, they go sideways. I always wondered why these were called "science blackboards." I could not see anything about a double blackboard that made it more useful for a chemistry teacher than for a mathematics teacher. I finally found that this idea could be traced back to Leadville, Colorado. In 1899, Dr. Elliott was Superintendent in Leadville and was a friend of Cubberley, who was teaching at Stanford. This was back in the days when Leadville had one of the show place school districts in the country. Dr. Elliott was very interested in science, so he designed a science complex. It was a double classroom, and in this double classroom was a "viewhood" arrangement. In the front of the "viewhood" and facing each classroom was a double blackboard. You could get behind the blackboard and the "viewhood" for demonstrations in the chemistry room. This idea got widely copied. If the school district was a poor school district and the school could not have two chemistry rooms, they could have one room with a "viewhood" behind it. There was a whole generation of chemistry teachers all over the country who grew up knowing about the Leadville science room. Soon they moved the "viewhood" to another place, but by this time, we had science teachers all over the country who had gotten used to the idea of having a double blackboard and liking it. So the "viewhood" was left, but the double blackboard stayed, and now we have double blackboards all over the country, but in schools where they never thought of putting a viewhood behind it. It is called a science blackboard, and there is no reason for it--it is just there. We have this kind of thing in our facilities all the way through. We also have this kind of thing in our staffing, and consequently, I would like to expose some of the biases that we have looked at as we have investigated the program and tried to consider some alternatives.

For example, for a moment, think of the problem of assessing achievement, and assessing achievement is certainly important. I submit that in a typical high school program, we use time, not achievement, as our basic criterion. You ask someone, "Do you speak French?" or, "Do you know French?", and the answer is, "I have had four years." That is the way we think of it now; that is the way we talk it. The answer is, "I have had so many years." The criterion is how long you have kept the seat warm.

As another example, we will consider ninth grade English. How do you know when the student comes to the end of ninth grade English? There is only one way to tell, and that is by following the calendar since some students come into ninth grade English knowing more than other students who successfully finish ninth grade English. If you have ever sat in on any English department discussion, you know the battle of the bulges that go on there, in terms of deciding whether "To Build a Fire" is going to be taught in the ninth grade or the tenth grade. Woe be unto the ninth grade teacher who lets students read "To Build a Fire" because that has been designated as part of the tenth grade curriculum. This time notion is sheer nonsense because English has never been very well analyzed in terms of what in the world students should be taught. We have retreated to the idea that you just sit there. If you sit there for thirty-six weeks, that is one unit of credit. We have given an example of a time criterion instead of an achievement criterion.

If we want to use performance as a measure of achievement, we would say, "How well do you know French?", and the person should be able to say, "I can read a French newspaper and understand about 80 percent of what is going on." Or, "If I speak to a Frenchman and he speaks slowly, I can get the gist of the conversation." That is a performance criterion, and it does not make any difference whether it takes six weeks, six months, or six years. I want to know how well a person can read, in terms of a reading rate, and in terms of a comprehension rate. I want to know how well he can write, and how effectively he can write. I want to know how well he can type and what is his error rate. These are performance criteria, but these criteria are hard to find in schools. There are elements of performance criteria that are much more carefully defined in some subject areas than in others. Those in the foreign language field are doing a good job in developing language level criteria.

In vocational education, you have a semblance of performance criteria in many different places, but just when someone is about ready to pin a gold star on your paper, you go back to the three-hour argument. The final resort so far has been to throw away the performance criteria and go back to, "It must be three hours for so many years." Again, you are no worse than anybody else in doing this, but perhaps we are asking the basic question--"Is there some way we can reorganize and restructure the educational program so we can identify performance criteria rather than time criteria?" That is really the essence of what we are asking. Please note that this is a curriculum question, not simply an organizational, "gimmicky" kind of question. I couldn't care less whether we have something called modules, or large groups, or small groups, or long, or short, or anything similar to them.

I am not trying to erode away the requirements, and I am not trying to compromise what you are trying to accomplish in a vocational educational program. I am perfectly willing to accept the findings that would say you need more time, as well as the findings that would say you need less time. I think the questions are going to be concerned with how do we restructure the time, how do we focus it, and how do we get more time for some students and less time for other students? These are the critical questions.

This is not a modest goal that we have undertaken. It is a very immodest goal, and this is why Dr. Barlow is absolutely right when he says that whether or not it is going to work has not been demonstrated. However, let me just go through some of the issues in innovation that we are seeking to answer in our flexible scheduling project. We want to look at staff utilization. I mentioned, previously, some of the things we were talking about in terms of the differentiated staff. We are trying to re-think the whole notion of staffing and the whole idea that there should be different kinds of staffing in terms of technical and support personnel, in addition to teaching personnel. I always run into the standard recommendation that in a vocational class, the top end of it should be twenty-four. In theory, it might be better to have a vocational area which is able to handle sixty, seventy, eighty, or ninety students, and which utilizes several staff members with different competencies and different kinds of preparation. That is, if you have a really professional teacher, why should that professional teacher have to collect papers and grade them, or take attendance, or keep a shop inventory, or handle these kinds of things? It does not take four to six years of college education to do these things, and neither does it take four to six years of college education to provide the specialized understanding in the T. and I. sense, of experience in a trade. We can identify a number of different functions that go on in an instructional situation. It seems to me that maybe we are going to be able to do a better job as a whole, if we stop arguing about whether or not a person should have practical experience on the job and accept the idea that some teacher preparation versus job experience should be the basic program of teacher preparation. Maybe the answer is that we need several different kinds of people in the teaching complex. Some of them might come from one kind of background, and some of them might come from other kinds of backgrounds; some of them may be full-time and some may be part-time. These are the kinds of considerations that are basic. I am not trying to simply increase the teacher load by saying that maybe we should have classes of fifty, sixty, or seventy students. I am trying to say that I think we have to go behind the basic assumptions we have been making and ask if there are alternatives. One of the biggest considerations here is staff utilization.

The use of time is the villain in the whole piece because time has been the sine qua non of achievement in the curriculum. I think we have to look at some alternatives in the matter of time. Right now we have somewhat of a general purpose approach. We have only one decision to make. In academic subjects, it is, "Do we want five hours, a week, or nothing?" That is our choice. In a full-fledged program of vocational education, the question is, "Do we want fifteen hours a week or nothing?" It seems to me that there is not much of a choice or much of a rationale for this. I would rather identify certain performance criteria I want a person to be able to meet at a certain stage of the game, and then work for a program which will develop these performance criteria. For example, we have laboratories designed as multi-useful spaces. They are designed in such a way that if I am instructing people in a class situation, the laboratory remains empty, and if students are working in the laboratory, the instructional space remains empty. The instructional space is for twenty-four people, and the laboratory space is for twenty-four people.

Before I proceed, I want to go back and identify certain kinds of functions, and for certain kinds of functions, a large group of 200 is fine. Why should I have to repeat certain kinds of basic presentations to twenty-four students at a time, over and over again. Perhaps I can schedule a large group of 200, and maybe this will meet for a half-hour a week. Maybe one of these presentations a week is enough, or maybe two. Again, I am not proposing any particular format; I am only proposing alternatives, or possible alternatives.

Another question is, "What need do I have for small group instruction when I may have eight or ten students?" We could have arguments about what number there should be for small group instruction. We are really shifting over here to curriculum and organization considerations. People tend to think of small-group instruction as a special skill. I was reading, for example, the book to which you referred earlier as the Eddy document. There is a lesson in it on questioning. The types of things that are in it are fairly good, only it would leave someone with the notion that questioning is a total monolithic concept. However, I can think of at least 200 different premises for questioning, and for some of the purposes of questioning, the things that are mentioned in that volume are actually wrong. For example, there is a general statement that, "You should always ask a student a question to get him to think." Sometimes I, as a teacher, want to ask him a question to find out that he does not know the answer, or that he does know the answer. Sometimes I want to ask a question that is a question of sheer fact, to get this sheer fact straightened out, and then go on from there. This does not detract from the basic idea that the problem is that most of the teachers are going to ask too many questions which are simply at the factual level, and the purpose of the manual is to get teachers to go beyond that very simplistic kind of question to something a little more basic and a little more important. I am not disagreeing, but the point is that this manual leaves people with the concept that something called questioning is a particular something, rather than dozens and dozens of different somethings.

We also tend to think of small-group instruction as a something, and small-group instruction is not a basic something at all. For some purposes, I want student-led groups; for other purposes I want short-term groups. Some groups are what I would call production-oriented groups; other groups are analytical groups. Maybe, I do not want a group to produce a project; I might want them to exchange ideas in order to learn. Again, this area is complex, but the question is, "Do I want to have some small-group experience scheduled here?" Sometimes it is a talking kind of experience. I do not know enough about the area to say when, and, or even if; all I know is that if I ask this kind of question, it ought to be something people have thought about. This is as far as we can go.

I think I would like to have something called "open" laboratory. Perhaps this is one of the most powerful devices of flexible scheduling which can be applied to a vocational program. We could have the total structure of the school set up as we do in some of our experimental schools--there a student has approximately 40 percent of his time to devote to his individual study and is free to go wherever he pleases. "Wherever he pleases" is usually defined as maybe five, six, eight, or ten different study areas, of which the "open" laboratory is one. If he has 40 percent of his time free from formal scheduling like this, then notice the kinds of things that can be done. I can say, "Johnny, you go to the laboratory, and your responsibility is to be in that laboratory until you accomplish 'X.'" One student may take two hours, one student may take three hours, and another student may take four hours, but they all know that they are not finished until they have accomplished "X." You should get that kind of acceptability. In some instances, you may have some short projects; in other instances, you may have long projects; and so one day a student might have a short laboratory assignment, and another time he might have a long laboratory or shop assignment.

Also, I can have different kinds of laboratory experiences. Now a student is either assigned to the laboratory for this course, or he is not assigned. Under a more flexible program, I can have all the different shop areas and all the different laboratory areas available to students at different times, depending on the curriculum they are to meet. If I want to send a student to the physics laboratory, I can send him; and if the physics laboratory is an "open" laboratory, the physics teacher can work with him on that particular type of project and that particular competence. In this way, the total facilities of the school become available to the total student body. It means much more coordinating, but we are asking, "Is there any room for an open laboratory?" Might this be an alternative to consider?

As far as the curriculum is concerned, it is in a sad state of disrepair. We are still back at the point where we are adding chapters to the textbook at the end of every presidential administration. The curriculum is changing faster than that. The question is, "Does knowledge double every five years or every eight years?" However, we are still adding chapters at the end of the textbooks, and it just is not going to work like that any more. Another problem is illustrated by the fact that in social studies, Columbus sails in the fifth grade, he sails in the eighth grade, and he sails in the eleventh, and he never gets anywhere. This is organizational nonsense, and we cannot defend it because, just like "Topsy," it grew.

We can go through the school curriculum; and if I had to nominate the single worst curriculum in the whole high school program, I would nominate the mathematics curriculum. If you look at the mathematics curriculum, in Grade Seven, we have five hours a week of something called review. In Grade Eight, we have another five hours of something called review. The brightest students escape to algebra at the eighth grade. This is still viewed with grave suspicion in many parts of the country and in many schools, but most of the students have review. Then in Grade Nine, the college preparatory students go on to algebra, and on to geometry, but the average students take something called general mathematics. General mathematics, as you know, is review. What we do is hit them over the head and hit them over the head again, and then hit them over the head again, to make sure that they hate mathematics for the rest of their lives. This is the way it comes out. Mathematics is one of the most thoroughly hated subjects in the whole curriculum even though it is one of the most useful subjects; and yet this is the place where we do one of the least effective jobs. It gets worse instead of better with the average student, because in Grades Ten through Twelve, there isn't any mathematics.

Yet, if you look at the syllabus that is filed at the central office, I guarantee that whatever else is there, there is something about building and maintaining certain kinds of computational skills. Where is the maintaining part found in this kind of curriculum? In former years, Grade Twelve had something called senior arithmetic, but we discontinued it because it was so unsatisfactory, both for the students and the teachers. Now, we have moved that back to the ninth grade and just do not bother to see how unsatisfactory is is there. How do we defend this curriculum? How can there be any educational rationale? Under our flexible scheduling program, I can guarantee you that if I give students only two hours or only twelve hours over the six years, I can give you a better job of building and maintaining arithmetic and mathematical skills with twelve hours of curriculum than fifteen. I would be even happier if you would let me take away hours as a criterion and substitute performance criteria. For some students, maybe a half hour a week, in terms of some skill maintenance activity, makes sense with different patterns at different times.

As long as we are confined within a structure where the organization says one-hour blocks, we do not decide what we want to teach; rather we decide what can we teach within a one-hour block, or within a three-hour block. I am absolutely convinced it is just as ridiculous to think that all T. and I. subjects demand exactly three hours a day, five days a week, as it is to think that all academic subjects demand exactly one hour a day, five days a week. I think the viable source of this ridiculous assumption is that it was obvious that the one-hour pattern that was typical for academic areas simply would not fit here. I am in thorough agreement, but the remedy is the wrong remedy because we do not go to an extreme orthodoxy to overcome another orthodoxy. If you do this, you need to have the availability of scheduling for all different sizes, shapes, and pieces, and this is where the computer comes in.

I think another issue is the issue of objectives, and we got quite close to this yesterday when we started philosophizing about cost of occupational preparation versus specific preparation. Some of these things are just plain unanswerable. It is like that bandsaw reference you started out with yesterday; but, on the other hand, I think some of these things are subject to a look and a different frame of reference. It would be good if all of us could stop being defensive, and I am not just talking about vocational education; I am talking about all of us because, for example, the English teachers are about as defensive as any group of teachers I have ever met in my life. Their curriculum is one of the worst because they just do not pretend to do the job they need to do. They have students in something they call remedial classes, but remedial does not mean that at all. Remedial means that you can get over something, but they do not mean remedial. These are the students they consider lost causes. If you show me the student who ever got out of a remedial English class and went back into a regular one, I'll retract my statement. You do not find young people who get over being classed as remedial. This is just a euphemism to make people feel good, and I think that is foolish. There are certain types of things that could be remedied if you look at them specifically. Most English teachers are not really English teachers at all--they are literature teachers, and they have come from a background of literature in college. They just automatically transmit that background. Starting with the English situation, we can turn to all sorts of other things that are happening in the curriculum which are equally indefensible. You start getting vocational programs that start back-filling against an inadequate English program until you get vocational programs trying to teach English. I cannot defend that, but that is really not your fault; it is the fault of the teachers who do not do their work properly earlier in school.

Let me go directly to the heart of the matter and try to get back to students and look at something we call academic merit. By academic merit, I mean merit in terms of the way the students get along in school. I am perfectly willing to call vocational education as academic as anything else. As far as I am concerned, if it is taught in school, it is academic; and to spend a long time arguing over what is academic and what is not, I think, is a fruitless argument. However, I think we have to realize success in school comes from, first of all, such things as home environment and support; and as much as we wish it were not true, this still is a very important factor. We have to realize this factor and build our programs to take it into consideration.

One of the biggest issues in scheduling is whether or not we ask the students to do homework. You are better off than most academic areas because homework is prejudicial against students who come from certain home environments and backgrounds. The very student who has the roughest deal at home is the one who needs to do homework the most and who has the least opportunity to do it. The organization and the structure of the school is actually prejudicial against the very students who need the work the most. We need to look at them and examine their situation. This is, again, where flexible scheduling can come in and make a self-contained day, to get rid of the leverage on the prejudice. They already have a hard enough time because of their previous learning experience and background. That is, a student who comes from a home where, "Ain't we done good?" is the standard of English, has a different learning job than the student who comes from a home where effective English is spoken. We have the problem concerning ability to learn, which is well-documented. This is something people do not argue about any more, but verbal agility is one which is not so well recognized as a rule. The student who speaks up and is very verbal always rates higher on teacher liking than the student who is not verbal. It turns out that grades are more highly correlated with teacher liking than they are with student ability. This is verified time and time again. Teachers get very defensive and they say, "Well, I like the students because they do well," but I think that is moot.

Also, we do not know when we need to look at study habits, and in this respect, we, in the profession, are absolutely irresponsible. I do not know enough about T. and I. to know whether you are as bad as the academicians, but I know the academicians are absolutely irresponsible because the only time they worry about a student's study habits is when he does not get the job done. If Johnny has the homework to hand in on Tuesday, then as far as the teacher is concerned, that is the end of it. The teacher never bothers to find out whether Johnny spent ten hours doing something that should have taken two. We have this kind of approach to mediocrity where, if you meet certain formal criteria, then the teachers are uninterested. The teacher has as much responsibility to find out if Johnny is spending too much time on an assignment as the teacher has responsibility to find out if Johnny is spending too little time. Again, I do not know enough about T. and I. to know whether this is your problem or not, but I suspect that there might be some equivalents here or some parallels.

Then we must consider the idea of creativity. Once again, creativity is like mother, apple pie and the flag--everybody is in favor of creativity; but you get into school and creativity is not rewarded at all. Cooperation and conformity are rewarded. Suppose the English teachers ask for a theme and the student writes a poem. How far do you think the student will get? We do not reward creativity. A certain amount of cooperation and conformity is necessary if the school is to survive as an institution. It becomes critical to identify when we need cooperation and conformity, and when will we tolerate creativity. Just generally being piously hopeful about creativity yields nothing; we need to recognize when we need cooperation and conformity and get it, and then recognize when we can tolerate creativity.

The final ingredient is attitude toward learning in school and teachers, and these attitudes become very critical. Many students have enough capacity to achieve success, but because of their attitude toward learning and school, they are inevitably defeated. Even this is only half the story because the other half of the story is the personal merit of the student. Personal merit comes from such things as responsibility, congeniality, activity, maturity, loyalty, concern, and consideration, as well as academic competence and academic merit. The point is that too often teachers get threatened because the student is not learning academically, and then they "take it out" on the student personally. Because the student does not do well in class, he is telling the teacher that he is not teaching correctly. The teacher says to himself, "If Johnny could go away, my day would be complete." You have these little "brats," and you say, "If only he would not come to school today, this would be the best present anyone could give me." We need to consciously remember what we already know--that there is distinction between the personal merit of the student and the academic merit. It means that somehow or other we have to be able to look Johnny right in the eye and say, "Look, you and I both know you may never be able to operate a lathe, but that has nothing to do with how good a person you are." The teacher has to be comfortable and confident enough so the lack of academic merit does not get transferred to the personal merit of the student. That is really, I guess, where I would like to leave this subject because what we are after in terms of our flexible scheduling program is to look at alternatives.

Again, we do not have answers, but the kinds of questions we are asking are probably important questions to ask; at least we are betting a great deal and investing--well, I am investing a good portion of my career in betting this way. The U. S. Office of Education at this juncture is betting on us that this is an important question. Dr. Barlow is investing time, and the rest of the members of our Advisory Committee are investing a lot of time. We think it is important to try to get some of these things connected and coordinated.

A CURSORY STUDY OF INNOVATIONS IN TRADE-TECHNICAL TEACHER EDUCATION IN THE UNITED STATES

by

David Allen[1]

Introduction

In his annual report to Congress in 1843, Henry L. Ellsworth, first United States Commissioner of Patenss, wrote: "The advancement of the arts from year to year taxes our credulity and seems to presage the arrival of that period when human improvement must end."[2]

This statement is thought to be the origin of the story that a Patent Office official once resigned because, as he said, "Everything has been invented." Fortunately, we in trade-technical teacher education have not reached the conclusion that all there is to know in teacher education is known. Rather we have continually endeavored to improve teacher education by integrating the newest research findings into the trade-technical teacher education programs.

Regrettably, little information is exchanged between states concerning the varying efforts they are making to increase the effectiveness of their trade-technical teacher education programs. Hence this study, which is being presented as an initial exploration of the programs of various states to determine the extent of innovations being used. This limited study was undertaken at the suggestion of The Center for Vocational and Technical Education of The Ohio State University.

The Problem

This study has three objectives. The first is the identification and comparison of changes in recruitment and selection of teachers, education curriculum structure, sequence and content of education courses, methods of presenting teacher education instruction, and methods of evaluating the teacher education programs. The second is identification and comparison of teaching certification requirements in various states. The third is identification and comparison of the type and amount of professional teacher education preparation required by various states.

Limitations

The major limitation to this study is its lack of a point of reference that would, if contained herein, permit a clear-cut comparison

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[1] Dr. Allen is Supervisor, Trade-Technical Teacher Education, University of California, Los Angeles.

[2] Henry L. Ellsworth, Annual Report of the Commissioner of Patents for the Year 1843, Document 177, Twenty-eighth Congress, First Session, House of Representatives. Washington, D.C.: Blair and Rives Printers, 1844. p. 5.

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of currently acceptable practices in trade-technical teacher education and of innovations that exceed the standards of even the better programs of trade-technical teacher education. This lack makes difficult any discrimination between changes that have been made to materially advance teacher education and changes that have been made simply to raise a program to a level of minimal acceptability. However, it was felt that sufficient information was gained from the respondent trade-technical teacher educators to provide some indication of changes currently being made in trade-technical teacher education.

The Questionnaire

A one-page questionnaire was developed as the survey instrument and was mailed to many leaders in trade-technical teacher education in the United States and Puerto Rico. (The questionnaire is shown in Table 1.)

Table 1

Example of Questionnaire Form

	1 Slight Change	2 Moderate Change	3 Extensive Change	4 Revolutionary Change
Teacher Recruitment				
Teacher Selection				
Teacher Education Curriculum				
Teacher Education Courses (sequence and content)				
Teacher Education Instructional Program (methods of presentation)				
Evaluation of Teacher Education Program				

Each educator was asked to make additional comments or attach appropriate materials related to any one of the six areas of inquiry for which he was checking either the third or fourth column. Two further inquiries were made. The first concerned teacher certification requirements and the second concerned professional teacher education requirements.

In an introductory statement to the questionnaire, each respondent was asked to indicate innovations that had been incorporated into his teacher education program during the past five years.

The Findings

The questionnaire was mailed to trade-technical teacher educators in all fifty states, in the District of Columbia, and in Puerto Rico. Responses were received from thirty-eight states, the District of Columbia, and Puerto Rico. Twelve states did not respond. Several of the states sent more than one response, apparently because the responsibility for trade-technical teacher education is carried by more than a single agency in some states. California also completed a questionnaire, thus bringing the total to fifty responses.

Of the fifty respondents, eleven indicated that "Extensive change" or "Revolutionary change" had occurred in one or more of the six areas of inquiry (teacher recruitment, teacher selection, and so forth). The number of states reporting "Slight change" ranged from thirteen to twenty-three. Table 2 shows the number of responses and percent of change.

Table 2

Tabulated Results of Responses to Questionnaire

Areas of Inquiry	Slight Change		Moderate Change		Extensive Change		Revolutionary Change		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Teacher Recruitment	23	46	20	40	6	12	1	2	50	100
Teacher Selection	22	44	23	46	5	10	0	0	50	100
Teacher Education Curriculum	18	36	15	30	15	30	2	4	50	100
Teacher Education Courses (sequence and content)	15	30	20	40	14	28	1	2	50	100

Table 2 (contd.)

Areas of Inquiry	Slight Change		Moderate Change		Extensive Change		Revolutionary Change		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Teacher Education Instructional Programs (methods of presentation)	13	26	23	46	10	20	4	8	50	100
Evaluation of Teacher Education Program	22	44	19	38	7	14	2	4	50	100

It appears that methods of instructional presentation show the greatest change; areas of teacher recruitment, teacher selection, and teacher education courses (sequence and content) show the least change. It should be stated again that it is difficult to identify from the responses the degree to which a revolutionary change has increased the effectiveness of a program, unless the point from which a change is made known. However, attachments and written statements indicate that those states reporting radical changes in general are ahead of those reporting only slight changes.

In identifying teaching requirements in certain states, it was found that thirty respondents, including the District of Columbia and Puerto Rico, had certification systems and trade-technical teacher preparation requirements. Two of the respondents that indicated the college requirements did not state the number of units required. Others indicated unit credit requirements that ranged from four units to 130 units. Table 3 gives a breakdown of number of units required by the respondents to the questionnaire. Two of the states requiring certification also require both college units and workshops. One of these states provides annual workshops; the other provides periodic workshops.

Three states do not require certification or college units. They do provide teacher training through annual workshops. Five additional states do not have certification, college units, or workshop requirements; however, they do conduct activities for trade-technical teacher education, such as state conferences and teacher meetings.

Table 3

Number of College Units Required for Teaching Certification N=30

Frequency of Responses	Number of Required Units								
	Not Responding	4	6	8	9	10	12	15	16
1		x		x	x	x		x	x
2	x								
3			x						
4							x		

Table 3 (contd.)

Frequency of Responses	Number of Required Units								
	18	20	21	22	24	30	42	128	130
1			x	x			x	x	x
2		x				x			
3	x				x				
4									

Discussion

It appears from this limited examination that a wide diversity of trade-technical teacher education practices exists throughout the thirty-eight states, the District of Columbia, and Puerto Rico. Most states that responded to the study had teacher certification requirements and teacher preparation standards that must be met by individuals preparing to become trade-technical teachers. All respondents indicated slight changes in their programs. Eleven respondents indicated extensive changes or revolutionary changes. Although it is difficult to identify how far these changes may have advanced their programs, evidence is shown that change is taking place in trade-technical teacher education.

The problem of identifying innovations is not a new one to those in the field of trade-technical teacher education, who have long been occupied with the task of distinguishing a genuine change in teacher education from one that has been in use in one form or another for some length of time. According to the latest study written on innovations, prepared under the auspices of Phi Delta Kappa, some 628 abstracts concerning educational innovation have been compiled.[3] In reviewing this book, one finds difficulty in identifying innovation from current practice. In actuality, a practice that is new to one teacher education program may be an old technique to another. The difficulty in making a discrimination between the two is occasioned in many instances by two factors: first, by a certain lack of communication between trade-technical educators in regard to their program activities, and second, by the lack of a point of reference upon which to base minimum standards for trade-technical teacher education.

It is hoped that the major contribution this study will make is to help emphasize the need for the establishment of a reference point that will enable measurement of the progress of trade-technical teacher education programs throughout the nation. It is suggested that this point could be established through identification and consensus of what are the more effective practices in trade-technical teacher education. These practices could then be set as the minimal parameter of acceptability. States whose trade-technical teacher education programs do not meet this parameter would be encouraged to advance to the agreed upon standard. States whose programs are developed beyond the minimal parameter of acceptability could be rated in degrees of innovation. Thus a more adequate system could be created for correlating similarities and differences between the states, and at the same time, standards could be established for the total improvement of trade-technical teacher education in the United States.

Summary

Upon the suggestion of The Center for Vocational and Technical Education of The Ohio State University, a limited study was initiated to attempt to identify innovative practices in trade-technical teacher education in the United States. A questionnaire was developed and mailed to trade-technical teacher educators conducting trade-technical teacher education programs in the fifty states, the District of Columbia, and Puerto Rico. Fifty individuals representing thirty-eight states, the District of Columbia, and Puerto Rico responded to the questionnaire. Eleven respondents indicated "Extensive" or "Revolutionary" change in their teacher education programs. Because of a lack of a reference point for establishing the degree that these changes exceeded the better trade-technical teacher education practices in the nation, it was difficult to determine the amount of true innovation these changes represented. Written statements from those responding to the questionnaire made clear in some measure how extensive these changes were.

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[3] Berlie J. Fallon, ed., Educational Innovation in the United States. Bloomington: Phi Delta Kappa Press, 1966. pp. 1-248.

It is strongly recommended that minimum parameters be established for trade-technical teacher education based on practices generally considered to be best. These parameters could assist in the improvement of weak programs and encourage development of many other programs beyond the established parameters.

IMPLICATIONS OF COMPUTERIZED INSTRUCTION

by

George L. Brandon*

I have some preliminary statements to make or at least some limitations, on this particular topic, "Implications of Computerized Instruction." At Dr. Cotrell's first approach to me in terms of a topic of participation, I denied everything. About a week ago, he called me up and caught me in a weak moment. Would I talk a little bit about computerized instruction? I said, "Yes, but I prefer to have the group really discuss it, particularly in terms of its implications." Frankly, there's hardly a day goes by when I don't wonder what the implications really may be, and I feel, selfishly, that perhaps you may share some of your ideas about it. Certainly at your institutions, you are around a computer of some sort. In fact, you may be around an installation that is doing something about computerized instruction. I set myself up neither as a computer scientist nor as a research specialist. I think that the problem, as I see it, is the joint administration of the project which we have in C. A. I.--computer assisted instruction. You will recall that the first term that was coined for this purpose was "computer-based instruction." Our staff has simply shortened it to C. A. I. If the biggest problem is the administration of the project (I don't mean to be pessimistic about it), I'm wondering, however, how we administer a team effort devoted to both research about C. A. I., and to one of our old pressing problems, namely curriculum construction. We must zero in on both problems. Out particular project is four years in length and grosses out at about $1,116,000. We do become concerned about the team effort of thirty to forty people working in this research, and frankly, I wonder how we can get our specialists in curriculum to work with the research designers, the educational psychologists, and the areas of specialization as it is in our staffing--for instance, a designer, a specialist in new media, a specialist in tests and measurements, a specialist in verbal learning or verbal communication. Some of these positions are not staffed now. In a sense, we are faced with an inter-disciplinary problem, and related to some of this morning's discussions, how do we work together? Sometimes I feel that the research side of the staff couldn't care less whether it is experimenting with a curriculum in T. and I., or science, or literature or anything else, as long as it is a curriculum; maybe it's my challenge to say, "Well, the basic nature of our research is learning in technical education. To what extent, if any is it distinctive?"

C. A. I. is simply one medium. If we work with it long enough, we risk some kind of enchantment, and before long we have its capability inflated to a quite unrealistic point. This fact means that we need to look at each medium to find out what its unique and real asset may be. Essentially, C. A. I., as I use the term at Penn State, is a tutor. Our final success, and I'm guessing on this, may be as we place this tutor in relationship to many other media. This fact does not simplify the problem. As I look back on some of our old study guides, I can see there may come a day when C. A. I. can be an implement in related self-study.

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To put all of our eggs in the C. A. I. basket is, of course, ridiculous. Let me emphasize again, look at C. A. I. as a tutor.

Again as we talked about some of our problems this morning, particularly with staying on top of our literature, I think that we have an equally staggering problem in staying on top of all of the new media. The number and nature of new media are building up into an enormous profit-making industry; C. A. I. is no exception to this. C. A. I. is also related to the discussion yesterday as we thought about a different delegation of labor and a ranking of instructional staff from a lower echelon of teacher aide to a top ranking professional or professor. A hierarchy of this nature can be related intimately to C. A. I. with team teaching and team research.

No doubt, the central problem bothering psychologists these days is the matter of individual differences. When Pressey and Skinner first advocated the use of teaching machines, there was a good deal said about the fact that these gadgets could go a long way in meeting individual differences. There seems to be considerable disagreement on this fact, and people who have been associated with C. A. I. over at least the first generation of computers are suggesting that we sharpen up our specifications about individual differences as they are related to the computer and the courses that go into it. These specifications become "idiomorphic," and include such things as personalities of students, aptitudes, test scores, the whole battery of evidence, experience, and make-up that you and I commonly consider individual differences in people. It's going to be quite a job for a computer to adjust courses and branch instruction to accommodate this whole range of individual differences. Finally, the point was very well made by Dwight Allen yesterday that our problem is one of teaching people to know what they don't know. The computer may help here.

Our problems can be put under three large headings: first, the so-called technical. Here we are dealing with the hardware--the electronic, the mechanics, configurations, the computer as a communication tool, refinements of it, types of them. As usual in education, we're lagging far behind the technical capability. You already suspect this in terms of our ability to detect if people are really learning. The lag is painfully obvious as one of our staff reports some preliminary results on the reactions of students to C. A. I. His report, almost a year old now, includes some of his concerns which no longer exist. The hardware has been developed to the point where these weaknesses are overcome simply by technical adjustment. There is a brief paragraph in his report that may illustrate my point:

> A profile of the mean ratings on twelve attitude scales was constructed for the total group and separately for each course. An examination of the high points on the profile on student attitudes toward C. A. I. indicates that students found the experience highly interesting, good, fair, valuable, and active and that the students reported being able to give the machine more attention than a traditional classroom lecture.

> That students react favorably to a new and novel instructional technique such as C. A. I. is reassuring but not particularly surprising. The low points in the profile of student reactions may be of greater importance in pointing the way to improvement in the instructional system and toward new instructional strategies. The three lowest points in the profile indicated that the students reported being relatively tense as opposed to relaxed. They reported the program to be inflexible, and that they missed opportunities for discussion. These were three rather negative or low spots. Fifty-four of the sample reported being slightly tense during the first session of C. A. I. We have no decisive data at present to indicate that the reported tension had a positive or negative effect on student achievement and retention. It appears that some students are simply motivated to do well in the course while others get flustered by the machinery.

The technical development of C. A. I., then, far outstrips us. Our first variety of computer, I suppose the 1050, would not accept capital letters or punctuation. The student would put them in. The answer would come back "incorrect." "Try again." The capability is no longer missing; our modern computer now compensates for all this, edits the answers, does partial processing, so that technically many of these things have been corrected.

Our second problem is quite different--a semantic problem. A semantic problem--asking how precisely the transmitted signals convey the desired meanings--is concerned with the identity, or satisfactorily close approximation, of the interpretation of meaning by the receiver as compared with the intended meaning of the sender. For C. A. I., this is the problem of writing instructional programs. Writing programs is a troublesome spot. Most of us as college professors have difficulty in writing a C. A. I. course, largely for the reason that we cannot anticipate student questions and answers. I suppose that if we examine our traditional pattern of lecturing, perhaps as college professors we do not try to anticipate student reactions. Lack of this anticipation is fatal in C. A. I. Here again, the technical hardware can make many compensations, but, by and large, the computer is a stupid ox, and we will get back what we put in without any magic about it.

The third problem is one to which I briefly alluded in individual differences and the effectiveness of learning. We're talking now of creating a model--a student model after which we should pattern ourselves. Most of our problems we can put around this three-point complex.

It should be pointed out that C. A. I. is expensive. It has been pointed out repeatedly that the present costs of C. A. I. are prohibitive for all uses except research. One of our clues we can take from this fact. Current C. A. I. systems across the United States are concerned with more than "pure" research. Indeed, it is clearly implied that these systems are expected to be operable in the near future. To keep costs down, the suggestion is made that a computer could be used during normal school hours for instruction for large numbers of students, counseling, and displays for teachers and administrators. At night, the same machine could perform routine processing of payrolls, attendance records, cost accounts, and other administrative duties.

More important obstacles than cost must be surmounted, however. One of these is the negative or insecure attitude of many teachers toward programmed instruction. You notice, I said programmed instruction, not necessarily C. A. I. Although it is almost a cliche that teachers will not be replaced by programmed instruction but that they will be elevated to having a motivating function, the teacher's point of view should be considered for a moment. We encountered interesting teacher attitudes in our efforts to install two of our terminals at Williamsport and two of our terminals at Altoona. It is interesting to watch teachers' attitudes as they back off or are enthusiastic as they think of this "monster" as being around the school for a while. Many feel a little insecure. Many are quite uncertain and don't know quite what to make of it. We do a lot of reassuring usually around the question, "What can C. A. I. do for you?" In a few months, we shall be placing trial students at the two terminals in each city. One city, Williamsport, in technical education is pretty well geared to the so-called industrial technician or what you and I call the vocational type or variety. This is quite the reverse in Altoona where the students largely are attending a Commonwealth Campus whose rationale is on the basis of the engineering technician. It will be interesting to observe these students and their encounters with C. A. I., their achievements, and teacher and student attitudes. That's our next step.

In terms of implications, think with me for a moment. Obviously, implications are many and important. Going back to what I think Merle Strong said yesterday, and bordering on the fact that we need some kind of action program that's characterized by crash, short-range, pretty-quick solutions, this is the appeal of C. A. I. to me. Undoubtedly, it has strong implications for crash effects and crash programs. The organization in most of our systems of teacher training in our field, which is linked up very closely between state agencies or state departments and institutions, suggests that it may be relatively easy to couple up entire state programs in a system of terminals and computers if we had the courses programmed. Thus, part-time teachers and full-time personnel could have ready access to C. A. I. We should think of it, however, not in terms of C. A. I.'s being sufficient to the complete instructional task. It will have to be backed up by materials, references, study guides, correspondence courses, and so on.

Obviously, it may have a similar application for direct teaching in the classroom, not considering here, teacher education. We're using our same hardware at Penn State for vocational guidance. This effort is not to simulate the guidance process, but it does try to profile some rather common jobs and student characteristics and achieve a match through the computer. Our guinea pigs here will be ninth and tenth graders who are initially exploring some jobs. Soon our typewriter terminals and random access slide projections and tape recorders will be piped into a Penn State 360 computer instead of tele-processing as we do now between University Park and Yorktown Heights, New York. You can see that our technical problems are quickly overcome.

I remind myself, and yet technically I do not know enough about it, to suspect a strong implication for our old curriculum construction problem. I have to defer judgment on this implication to a technician who may know the hardware and capability better than I. Possible we could create a model or matrix to accommodate job analysis and curriculum content. The rapidity with which jobs are changing and the lag in our curriculum suggest that we need an agent similar to a computer.

C. A. I. is saying something to us, as the micro-teaching did to me yesterday, about our whole process of competency testing. We have few measurement specialists working with our C. A. I. up to this point, but the little discussion I have heard of C. A. I. as related to tests and measurements is very encouraging.

We should seek ways of involving our teachers as occupational specialists in C. A. I. course writing as we sometimes do in writing instructional materials. In ou original research proposal, we had planned to do this--to bring in eight or ten shop teachers and train them in course writer language for course writing for C. A. I. This plan was shot down and eliminated as it was not acceptable to the funders; but in the terms of our making crash programs and haste in progress, I'm quite sure that we must use our own trade and occupational specialists.

Our big problem at the moment is staffing, and unfortunately, staffing of personnel with vocational and technical backgrounds. Many graduate assistantships and full-time continuing positions are available. I am concerned that if the curriculum research team members get fewer and weaker and their psychological teammates become more and specialized, we will be very unbalanced. This condition and problem is neither novel nor new--we need teamwork in all of our efforts and operations.

SUMMARY OF REMARKS CONCERNING USE OF EDUCATIONAL TELEVISION FOR TEACHER TRAINING IN NORTH CAROLINA

by

Durwin M. Hanson*

One of the problems common to most T. and I. teacher trainers is how to provide adequate teacher training courses for all personnel in the state. Although off-campus classes assist in reaching large numbers, there still remains a segment within a state whereby T. and I. teachers are unable to attend class due to the distances involved or problems of class scheduling. In an attempt to maximize the use of our faculty at North Carolina State University, it was decided to present one of our courses via the educational television network.

Several years ago, the North Carolina General Assembly authorized the establishment of a statewide educational television network with provisions to enable colleges and universities to offer college credit courses via this medium. At the time of planning to offer a course, it was anticipated that six stations would be in operation to afford adequate coverage of the state. However, a few weeks prior to telecasting, it was learned that only three stations would be available and that only one of these would be located in an area not currently covered by off-campus classes. Thus, it was planned to tape the telecasts and make the course available at a later date to the newly established stations.

The course, Education 100--Introduction to Industrial Education (2 semester hours credit), was presented during the spring semester, 1966. The instructors from the Industrial and Technical Education Department, N. C. State University, were Mr. Robert A. Mullen and Mr. Willis Parker. A topical outline is included in this report as a review of the areas presented. The total television series included twenty-four one-hour presentations, available on Tuesdays and Thursdays at 4:00 p.m. In addition to the telecasts, the students (T. and I. teachers) assembled on campus for two scheduled meetings during the course to discuss items concerning the material covered, review assignment papers (reports) which had been mailed to Mr. Parker, and to critique the television presentations. The final examination was given on campus at the close of the television presentation, and at this meeting, the students were required to give a final appraisal of the course as offered by television. A total of thirty-five instructors enrolled in the course for credit. An additional 252 people indicated that they viewed the program, and it was gratifying to know that the majority of this viewing group from industry had requested additional information concerning secondary and post-secondary vocational education in North Carolina.

In the evaluation of the course as presented over television, the students were impressed with the fact that Mr. Mullen and Mr. Parker included

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interviews, panels, and presentations by vocational leaders from the N. C. State Department of Public Instruction, such as: Mr. Bullard, State Director, Division of Vocational Education; Mr. Charles Bates, State T. and I. Supervisor and his staff; Dr. Ready, Director of the Department of Community Colleges and his staff; representation from the State Board of Education; and Mr. Oleson from the Vocational Curriculum Materials Laboratory. In addition to the State Department personnel, a number of industrialists, apprentices, and former vocational industrial education graduates were interviewed during the course to reinforce the values of vocational education. As to the effectiveness of the television program compared to attending class, 52 percent of the group stated the ETV program was as effective as regular class attendance. The main criticism was that in many instances the speed of presentation did not permit sufficient time to take notes. Seventy-five percent reported that the visuals (charts, graphs, transparencies, etc.) were very effective and requested that additional use of visuals would greatly assist in providing time to take notes since copies of the visual material were sent to each student prior to telecasting the information. Additional favorable comments from students included the following:

> "convenience of having course 'at home' or 'at school'"
>
> "extreme value in seeing as well as hearing from State Vocational Education Director and others"
>
> "time of presentation and length of program did not interrupt school schedule"

The following comments were representative of unfavorable reaction to the ETV presentation:

> "Outside of contacts during the regular scheduled group meetings on campus, there was no opportunity for free exchange of ideas or discussion."
>
> "noisy and snowy TV reception in fringe areas"
>
> "novelty of ETV wore off"
>
> "need to develop new study habits regarding ETV courses"

In general, it was generally agreed that using authorities such as the State Vocational Education Director, State T. and I. Supervisor, etc., to discuss particular phases of the total N. C. vocational program, far outweighed the negative aspects of the television course.

Although it was originally thought that the ETV would maximize the efforts of our faculty, it was generally accepted that for each one-hour television presentation, on the average, eight hours of preparation were required. The (WUNC-TV) station prepared all the visuals and assisted in the preparation of the script which would greatly add to the instructor's release time if he were to prepare his own visuals. In addition to the release time of Mr. Parker and Mr. Mullen, the only cost to the department was the purchase of tapes.

As to future plans, it is our intention to follow-up ED 100--Introduction to Industrial Education, with a credit course in History and Philosophy in Vocational and Technical Education, if the statewide television network develops to the stage whereby we may reach areas not now served by off-campus classes.

Topical Outline

I. Introduction

Preview of the course.

The need for education for work.

Definitions and vocabulary.

Education of Man for the World of Work

II. The relationship between man, education, and work.[12]

The problem.

The new technology.

The relationship between man and work.

The relationship between work and education.

The relationship between man and education.

Where we now stand.

III. The development of practical arts, vocational, and technical education.

The development of practical arts education.[3,9]

The development of vocational education.[12]

The development of technical education.[12]

IV. Vocational and technical education at the secondary level.

The total picture.[12]

The North Carolina program.[2]

V. Vocational and Technical Education at the Post-secondary level.

The total picture.[11c, 12]

The North Carolina program.[2]

VI. Other opportunities for occupational training.[12]

Continuing education in the public schools.

Higher education.

Business and industry.

Apprenticeship.

On-the-job training.

Proprietory schools.

Business schools.

Organized labor

The armed forces.

VII. Federal legislation aiding vocational education.[11b, 12]

The Smith-Hughes Act.

The George-Barden Act.

The National Defense Education Act.

The Area Redevelopment Act.

The Manpower Development and Training Act.

The Vocational Act of 1963.

Higher Education Facilities Act of 1963.

VIII. Administration of the Federally Aided Program.

Organization for vocational education.[11b]

Federal, State, and local relationships.[7, 11b]

State plans.[7, 10]

Supervision of instruction.[7, 10]

Teacher education.[7, 10]

Finance.[7, 10]

IX. Manpower needs, present and future.[12]

Population, the labor force, and mobility.

Manpower requirements.

Education and Manpower.

X. Major issues in vocational and technical education.

- Education and social status.
- Single purpose vs. comprehensive institutions.
- Learning and education.
- Higher education for the average student.
- Occupational guidance, placement and follow-up.
- Continuing occupational education.
- Teachers for vocational and technical education.
- Technology, planning, and leadership.
- National policies and occupational education.

Competencies Needed to Educate Man for Work

XI. Types of competencies needed.

- General understandings.
- Personal qualities.
- Teaching techniques.
- Class organization and management.
- Technical knowledge and instructor activities.
- Physical condition of shop and laboratory.
- Relationships.

XII. Development of the desired competencies.

- Work experience.
- College courses.
- Supervised teaching experience.
- Institutes, workshops, and company schools.
- Personal self-study and improvement.

XIII. Summary: Review of the course.

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    b. "Report of the Panel of Consultants"
    c. "Appendix I, Technical Training in the United States"

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THE DEVELOPMENT OF TRAINING LESSONS FOR PRE-SERVICE AND INITIAL IN-SERVICE VOCATIONAL TEACHER EDUCATION RECORDED AND PRESENTED THROUGH VIDEO TAPE AND TELEVISION WITH SEMINAR SESSIONS

by

Howard F. Nelson*

In making this presentation to you today, I have been asked by Dr. Cotrell to describe our television project for the pre- and in-service vocational teacher education program currently being conducted in Minnesota. I have, therefore, given you the complete title of the project since it was underwritten by Federal monies through the Special Grants portion of the Section 4(c) of the Vocational Education Act of 1963. For purposes of this presentation, I shall simply describe our project as the vocational teacher education program through the use of educational television.

Minnesota has nineteen Area Vocational Schools now in operation and approval has been given for six more new schools for a total of twenty-five. These area schools are strategically located throughout the State so that no person need travel more than thirty-five miles in order to attend them. As is also true in every other State, there has been a heavy demand for the expansion of vocational offerings in our State. Consequently, there has been a concurrent demand for the identification and training of sufficient new teachers to man these positions in the new schools and also cover the vacancies which normally occur through retirement.

Traditionally, the vocational schools of Minnesota have depended upon the recruiting of trade competent, highly skilled craftsmen and technicians from business and industry for their teaching staffs. When these people leave their work in business or industry to enter upon the new vocation of teaching in a vocational school, they are in immediate need of pre-service teacher preparation. In my State, these individuals may teach in the evening extension program after having been given a minimum of six clock hours of instruction. This amount of preparation will allow him to have a temporary certificate. However, if this teacher is to work in the all-day programs, he must have a minimum of one hundred and ninety-two clock hours of preparation.

While a teacher may begin teaching with the minimum of six clock hours mentioned earlier, an additional eighteen clock hours of instruction must be provided as quickly as possible for him. Thus, the initial training for first certification amounts to twenty-four clock hours. Responsibility for providing the eighteen additional clock hours of preparation rests with the Department of Industrial Education of the

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*Dr. Nelson is Professor and Chairman, Department of Industrial Education, University of Minnesota.

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Now, if we translate these circumstances into action as the number of area schools multiply in my state, you will immediately see that with the expansion of all programs and the addition of new schools, there is a very real need for the identification and preparation of new instructors. At the same time, those instructors who have obtained the initial twenty-four clock hours must be provided with further instruction until they have met the 192 clock hour requirement.

With this rather sketchy background of the over-all problem, it will become clear that we faced a situation in which the competencies of the teacher-training staff of the University had to be multiplied in some manner. The pilot program of this proposal being described was an attempt to use video tape recordings and television transmission as one device to provide pre-service and in-service teacher training instruction. The program was envisioned as one method of expanding the efficiency and effectiveness of the Industrial Education Department staff in order to meet the unprecedented demand for these services to the twenty-five area vocational schools.

A fairly careful review of the literature dealing with vocational teacher education research and development programs in progress does not reveal any on-going, state-wide use of modern mass media such as television to extend the services of teacher training simultaneously to all schools of a state. So far as we were able to learn, no attempt has been made to evaluate the possible benefits which might accrue from using centralized instruction as a supplement to the local teacher trainer.

And, before someone concludes prematurely that the twenty-four clock hours of instruction which I am describing today is a limited and narrow project, I must hasten to add that it is in fact part of a much broader project planned for the development, refinement and evaluation of alternative methods of providing effective teacher instruction to large and diversified groups of vocational teachers located at several area centers. If there were time, I would show a chart which illustrates the significance of this initial project in an over-all plan.

Ultimately, we expect to develop teaching guides and activity instruction sheets to cover the same content as the tapes. In addition, we expect to develop programmed instruction materials with a home study activity unit. Finally, we expect to run a comparative analysis and evaluation of the effectiveness and efficiency of learning and the relative costs of three-dimensional methods between (1) video tape and television transmission, (2) regular teacher educator presentation with activity instruction sheets, and (3) programmed instruction with home study activity.

Since the teacher educators from the University have for many years provided initial in-service, vocational teacher preparation in units of twenty-four clock hours, it seemed quite natural to adopt this same unit of time in developing the television tapes. Since the television station specified transmission time for each of the units at thirty minutes as the most appropriate exposure for this kind of presentation, we reached the decision to develop twelve, half-hour lessons. These half-hour presentations, followed immediately with a ninety-minute seminar for the participants, seemed to be the best possible arrangement. Since all tapes were made in advance, this plan allowed the presenter to be present at one seminar gathering following his lesson. In the first running of the series, provisions were made to televise to four cities where seminars were also set up for the participants. Since the presenter could attend only one seminar, it became necessary for all presenters to cooperate in covering the seminars by serving as leaders.

The task of determining appropriate course content for the twelve half-hour lessons was of crucial importance for several reasons: (1) the first evaluation of video tapes and the final evaluation of this method against other instructional methods in later activities of the project made this very important; (2) the development of outlines and script by the teacher educators responsible for the tapes had to start from the same base; (3) plans for the seminar discussions were based upon the selected content; (4) the writing of programmed instructional materials in a later project could not be accomplished without carefully selected content as a foundation. In actual practice, the course content finally selected was validated by personnel from the Department of Industrial Education, the State Department - Vocational Division, and the Area School directors and coordinators.

Prior to the final adoption of units of instruction, considerable time was devoted to the identification of basic objectives for the entire series. These are always of utmost importance in the development of instructional materials and are considered worthy of restating here at this time. As a result of having participated in the television sessions, a student should:

1. Understand and be able to use vocational and educational terminology as needed by the beginning vocational or technical school instructor.

2. Develop initial appreciations of the power and efficiency of sound educational practices and principles with regard to vocational and technical school teaching.

3. Understand the place and nature of vocational and technical school programs in the total program of public education.

4. Know the basic elements of an instructional analysis and be able to make an analysis of work and technical information.

5. Understand the principles underlying organization of content for teaching.

6. Understand the first principles involved in selected vocational-technical school teaching methods.

7. Know the principles and procedures involved in making a daily lesson plan.

8. Understand the kinds and types of audio and visual instructional aids and their place in a teaching method.

9. Understand the techniques involved in making and using projected instructional aids.

10. Know the common kinds of instruction sheets and their uses in the teaching process.

11. Know the common types of tests used to measure cognitive learnings.

12. Understand the nature and type of evaluative instruments suitable for the measurement of skill and affective behavior.

13. Understand and be able to judge techniques for laboratory and classroom management.

14. Be able to plan a program of self-evaluation and self-improvement for vocational and technical school teaching as a career.

Having adopted the above basic objectives, the next step involved decisions concerning the instructional units themselves. This could not be done until each of the objectives had been fully and completely clarified by writing behavioral change statements or descriptions of expected growth in competency. Having done this, it became relatively easy to determine what the separate instructional units had to be in order to cover the objectives. Thus, the following twelve television lessons were adopted. For this presentation today, I am going to list them and name the staff member who was responsible for their preparation and presentation.

Unit 1	Teaching in Vocational-Technical Schools	Howard F. Nelson
Unit 2	Analyzing for Instruction	William A. Kavanaugh
Unit 3	Organizing Course Components	William A. Kavanaugh
Unit 4	Planning the Lesson	Jerome Moss, Jr.
Unit 5	Teaching for Understanding	Jerome Moss, Jr.
Unit 6	Teaching for Motor Skill Development	David J. Pucel
Unit 7	Teaching with Instructional Aids	Neville P. Pearson

Unit 8	Developing Instructional Aids	Neville P. Pearson
Unit 9	Evaluating Instructional Outcomes	Robert R. Randleman
Unit 10	Developing Evaluative Materials	Robert R. Randleman
Unit 11	Managing Teaching-Learning Facilities	Robert R. Randleman
Unit 12	Planning Your Teaching Career	Howard F. Nelson

Since I have brought along copies of two of the above units and will show them if time permits, I shall not go into detail for any one. For the most part, the titles themselves seem quite self-explanatory, especially for anyone who has been involved in vocational teacher preparation.

In conjunction with each of the instructional units, the presenters developed a twenty-item, multiple choice test covering the content of the lesson. At the same time, materials were put together for the seminar discussion leader to use even though he was provisioned with copies of the television presentation. Each presenter also developed an outline parallel to his script which specified the subtitles to his main unit. These were in terms of what the student will understand, what he will be able to do, and descriptions of the ways in which the student will behave, act or change in attitudes or appreciations.

Upon completion of the first run of the television presentations, the video tapes were made into sixteen millimeter sound films so that any one or all of the twelve could be used in any of the Area schools as needed. If the series were to prove truly helpful, the project manager felt that the series on film had to be made available to qualified persons in the local school situation for use as needed with new instructors.

Now before showing the two video tapes which I have brought with me, may I make some broad observations of this technique for use in initial teacher education. All of the school directors were most enthusiastic about the series and were anxious to get copies of the films for their own schools.

Among the eighty students who participated in the series at the four centers used for the initial broadcast purposes, the student motivation was extremely high -- even despite poor transmission in one or two cases and in view of the poor broadcast time of 5:30 to 6:00 p.m. Attendance at the seminars held at nearly one hundred percent for the twelve sessions, and this, in spite of Minnesota winters, was most gratifying.

In a more specific manner, I wish to list for you some of the advantages and disadvantages as these were observed during and after the television series.

Advantages:

1. The television programs served as an excellent recruiting device and if they had no other value, the series brought out some excellent people about whom we might otherwise have never learned.
2. The use of television in this instance seemed to have an unusually strong motivating element to it. If requests for a repeat of the series are any indication, there are a great many more well qualified people who would want to be participants.
3. The use of television in this manner makes it possible for key people among the teacher educators to make an impact on the participants.
4. Obviously, the video presentations served to multiply the efforts of specialists among the teacher educators.
5. Through the use of television, it would become possible to reach the isolated person or the small group located in the rural areas of the state. This is an important consideration when taken within the framework of the University's responsibility for vocational teacher education in Minnesota.
6. Video tapes, and now the sound films, appeal to the local directors of schools who must provide the initial six clock hours of preparation or provide it otherwise. The series has been developed into a kit form which can be used by qualified persons.

Disadvantages:

1. There were several instances when interference or other malfunction resulted in poor reception in one or two centers.
2. When using regular television, these materials must be shown when the station schedule permits. One cannot select the "most desirable" hour for the broadcast since what we might want usually turned out to be "prime time" wanted by everyone.
3. While the initial showing went only to four centers, if the training were to be projected state-wide, there would be a heavy demand for well prepared seminar leaders. Under no conditions could this charge be carried by University staff since educational television covers over 80 percent of the state.

4. As most of the presenters would agree, there is great need for expert video performers to handle the separate lessons.

5. For anyone who has been on television as a performer, the lack of inter-action and reactions from students raises serious questions about its use in teacher education.

In conclusion, I have raised several important questions about which we need more information. When the staff of Industrial Education has completed a thorough evaluation and study of the television work against other kinds of teacher education plans, we may be in a better position to decide that this has been a profitable experience for all concerned. At the same time, we may conclude that what we have done is simply one more way of conducting this work and should be part of the total package of best ways and means of handling this work. Time and research will tell.

In the meantime, the films and all supporting materials necessary to the conduct of the series are in the possession of the Vocational Division of the State Department of Education. Their office is located in the Centennial Building, St. Paul, where interested persons may obtain information about obtaining copies of these materials. We understand that complete copies will be made available for use throughout Minnesota and I would assume that there will also be additional copies made. In any event, if there is anything of interest which I can provide to those of you in attendance at this seminar, I hope that you will let me know. I will do my best to assist you.

THE CONTEMPORARY TRADE-TECHNICAL TEACHER EDUCATION PROGRAM IN CALIFORNIA

by
David Allen[1]

Introduction

Among the many varied programs for trade-technical teacher preparation developed in several states, the successful pattern emerging in California is one that compares favorably with other innovated teacher education programs in the nation. The continued success of trade-technical education in California is dependent upon obtaining and developing competent trade-technical teachers. This is a task that involves careful selection of appropriate educational experiences for new teachers, as well as a continual in-service program to maintain the subject matter and teaching proficiency for those who have been teaching for a number of years. The teacher education program in California has kept pace with the phenomenal growth of trade-technical education programs within the public schools of the state and has at the same time been in the vanguard in providing teacher education programs to meet new requirements for teachers. Continual research conducted in methods for improving the trade-technical teacher education program is concerned with the on-going program. Research is also directed toward making probes into the future to make certain that the trade-technical programs of instruction are kept current with occupational needs.

Certification Standards

To make clear the trade-technical teacher education program in California, a brief description of the requirements for teacher certification is necessary. An individual may become a full-time teacher in California by one of three methods. But regardless of which of these he uses to enter teaching, he must have a combined total of seven years of occupational preparation and experience. Three of the years must have been in the advanced aspects of his occupation. One of the years of work experience must have occurred within the three years just preceding the date the teaching credential is issued. The three ways that may be used are: 1) possession of an engineering degree or registration as a professional engineer in the State of California, plus three years of engineering work experience; 2) possession of a baccalaureate degree, plus three years of work experience consonant with the major, industrial chemistry or nursing, for instance; or 3) occupational preparation such as trade schools, apprenticeship, or equivalent training, plus a minimum of three years of advanced occupational experience. The individual who will teach on a part-time basis has a choice of four ways in which to satisfy teacher certification requirements. Three of them are the same as those a full-time teacher must fulfill. The fourth

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method of becoming a part-time teacher is the accumulation of five years' work experience, one year of which must have occurred within the three years just preceding issuance of the credential.

Professional teacher preparation will be discussed later in the paper. However, to qualify for eventual certification, it should be noted that the full-time teacher must have completed twenty-two units beyond those required to earn an Associate in Arts degree; the part-time instructor must have completed sixty clock-hours of teacher training. Both of these types of teachers may begin teaching before initiating their professional preparation course work. The full-time teacher must complete twelve units every two years, and the part-time teacher must complete the sixty-hour teacher training program during the first year he teaches. When the teacher has completed his professional preparation requirements, he is issued a credential for life.

Teacher Profile

A profile of beginning trade-technical teachers shows them to have a median work experience of eleven years and to be at a median age of thirty-nine. However, the mode for their work experience is eight years and for their age, thirty-two years. Thirty-nine percent of those entering trade-technical teacher education hold at least a Bachelor's degree, and of these, 10 percent hold higher degrees. An additional 7 percent hold AA degrees. Under the new credentialling regulations, the AA degree is one of the teacher preparation requirements. Statistics indicate that over 80 percent of those who lack a baccalaureate degree when they become teachers, subsequently enroll in a program leading toward this degree. In addition, 38 percent of those receiving their initial trade-technical credential already hold some other teaching credential.

Although more than 50 percent of those first entering trade-technical teaching lack formal college education, their maturity and experience aid them in obtaining higher degrees within a relatively short period of time. Hence, their high degree of subject-matter proficiency, their years of learning through practical experience, and their intense desire for self-improvement make up for their initial lack in formal college education. The result is a group of teachers equal to the best in the teaching profession.

Design of the Program

The primary objective of the trade-technical teacher education program in California is development of the technical instructor and promotion of the growth of the vocational educator. During the past five years, the program has continually undergone revision so that current developments applicable to trade-technical teacher education could be utilized. This effort has resulted in a program that is not a static but rather a dynamic program that makes use of team teaching, varying group activities, and constant evaluation. No textbook exists for this class; because of its dynamic nature, new instructional media for the class is constantly being developed for the instruction. The result is an ever evolving workbook. The program is designed to encourage teaching specialists, master teachers, and other supporting staff to make enriching contributions to the instruction.

The Model

To describe the concepts underlying the trade-technical teacher education program, a model has been developed. The model may be described as three vector forces pressing down on a plane opposed by a resultant vector force balancing the plane from the opposite side. This concept is shown in Figure 1.

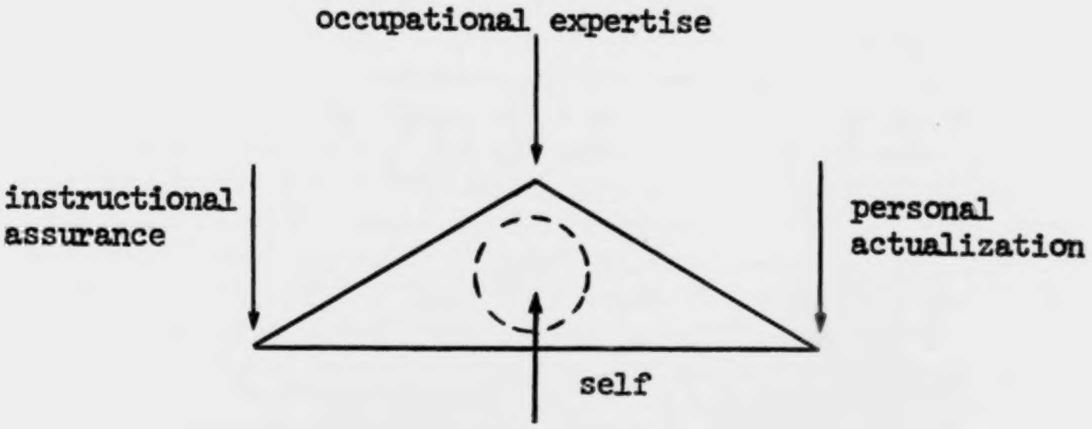

Figure 1

The vector forces that push down on the plane are identified as "occupational expertise," "instructional assurance," and "personal actualization." The resultant vector is the "self," those things which the instructor as an individual brings into the total interaction of these forces. It should be noted that a circle drawn on the plane indicates the parameter within which the resultant force may vary to balance the opposing three forces. This parameter identifies the acceptable instructor characteristics that are developed through practice. These acceptable characteristics vary from school district to school district and from instructor to instructor; however, the parameter indicates limits within which these variants may occur and still fall within acceptable limits. Each individual entering trade-technical teacher education possesses these vector forces in varying degrees. The teacher education program is designed to then provide an opportunity for realization of the full potential of the four forces and still maintain the resultant push within acceptable limits. It should be pointed out that these forces are not increased in magnitude and direction equally, they increase continually for as long as the resultant opposing force can balance these forces within the prescribed limits.

The force of occupational expertise is the occupational proficiency that the individual preparing to become a teacher brings with him from industry. This force has a minimum acceptable magnitude and direction when the teacher is first selected and recruited. As the teacher progresses through his life as a teacher, this force is continually strengthened by in-service workshops, work experience programs, seminars, and institutes.

This force is the initial determination in the statewide testing program that maintains a standard for subject-matter proficiency. The tests assure that teachers entering trade-technical teaching have occupational competency and are professionally trained in the subject which they will teach. This testing program consists of both written and performance examinations. In hiring new teachers, many school administrators rely to a great extent on the results of these tests.

The force of instructional assurance is concerned with the degree to which the teacher can guarantee that learning is taking place in his classroom and the conscientious effort he makes to continually improve the learning situation. It includes his communication of his instruction, his sensitivity to how well the students are learning, his establishment of a feedback system to the students, his evaluation of his instruction, his maintenance of the instructional occupational environment, and his ability to make his instruction concurrent with the occupation for which his students are preparing to work. Because the force of instructional assurance may be very weak in the beginning, it is this area where much of teacher education focuses its initial attention.

The force of personal actualization, according to English and English, represents "the processes of developing one's capacities and talents, of understanding and accepting oneself, of harmonizing or integrating one's motives. . ."[2] Teachers are encouraged to achieve personal actualization in many ways. During their experiences in the teacher education program, they develop skills for self-evaluation and are encouraged to develop their own programs for professional growth. Through legislative action, trade-technical teachers in California may earn college units for work experience and for personal accomplishments. These units assist them greatly in obtaining a baccalaureate degree. Such experiences help them achieve their goals, their needs, and their interests, thus further assisting them in continuing to achieve full professional development as teachers. The resultant force is the "self," the counterbalance that the individual brings into this entire configuration of the model.

Program Dynamics

Continuous action research is utilized to create a dynamic trade-technical teacher education program that is current with the evolving trade-technical education in California. As the teacher education program is analyzed and areas needing improvement are identified, various solutions are attempted and evaluated. Results of these evaluations are brought to a teacher education program advisory committee that reviews the activities and makes suggestions for further improvement. This committee meets for a number of days at a time so that they can give adequate study to the problems. Additional research is conducted through experimental programs in various junior colleges in the state so that innovations may be brought into the program. For example, an experimental program now in operation utilizes slide photographs taken of a teacher in the classroom at thirty second intervals and an audio tape recording made of the instruction at the same time. When the instructor has completed his presentation, he is given the opportunity of reviewing his efforts. Similar experiments have been conducted with video tape recorders. These types of activities are evaluated and, when found appropriate, are integrated into the teacher education programs.

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[2] Horace B. English and Ava C. English, A Comprehensive Dictionary of Psychological and Psychoanalytical Terms. New York: Longmans, Green and Company, Inc., 1958. P. 485.

Program Operation

Except for the elective courses, all other courses use the team teaching technique. A team teacher cannot work as an individual, as can the teacher who instructs a class by himself. He must work as part of a unit so that he can successfully relate his instruction to the material the other members of the team present. He must be present during an entire period of instruction being taught by the team so that he will be able to integrate his instruction with the joint presentations. Unlike many teacher education programs in which an instructor is brought from the outside to teach one or several classes and is left to determine his own instructional content, team teachers attend planning meetings prior to teaching their assignments, meetings at which they discuss in detail what they will teach and ways in which to best present their instruction.

The instructional material is multi-media. It includes workbooks, notes, instructional sheets, audio tapes, and programmed books. No textbook is used with the course, which thus necessitates the continual development of instructional materials designed to meet the ever changing program requirements. Closed circuit T.V. and video tapes are used, and technical subject specialists are brought into the programs to make presentations when their specialities are needed.

Evaluation of the programs is made by the teacher educators, who make their own critiques of each teaching session. They also review the student critiques at the end of each course. In addition, discussion is held with supervisors in various districts to see how well the teacher education program has prepared the teachers on their staffs. Levels of expectancy are being developed so that at varying points throughout the teacher education program, measurable behavioral changes that should occur within the teachers enrolled in the teacher education program can be measured.

Anatomy of the Program

The full-time teacher preparation program may be divided into three parts. These parts are: 1) supervised teaching; 2) a two-summer, contiguous, spiralled subject program; and 3) elective courses specifically designed to aid in further development of the trade-technical teacher.

Supervised Teaching

The supervised teaching classes are designed for those already teaching. The course provides for individual differences by dividing the class into three groups. Placement within each group is determined through past teacher education and teaching experiences. By this arrangement, specific assignments may be made to each of the groups so that teachers with varying backgrounds may all benefit from the course. Those teachers who have had a portion of the summer session program and no teaching experience are placed in one group; those who have taught and have had summer session preparation are placed in a second group; and those teachers who have no teaching experience and no summer session courses are placed in a third group.

Activities provided for each of the groups are designed to best meet each group's requirements. The teachers are visited in their classrooms, and they in turn are required to visit master teachers and make objective observation reports of the master teachers' performances. Each group has workbooks from which assignments are made. The members attend organized meetings planned to increase their teaching ability. Special meetings are held at locations away from the teachers' daily environments, for example, at the University of California Lake Arrowhead Conference Center. These meetings provide instruction in ways to eliminate communication barriers and increase sensitivity to others. In addition, on assigned days, subject groups and special problem groups meet with master teachers. The teachers taking the course teach before video tape cameras and review their performances through critiques provided by the teacher educators.

Summer Session

The summer session programs for the preparation of trade-technical teachers consist of twenty-four sessions spaced over a two-summer period. Twelve sessions are conducted the first summer and twelve the second. The program is so designed that subject content and activities are introduced and spiralled throughout the program to give a continuity and to emphasize the development of effective trade-technical teachers. Considerable emphasis is given to small group interaction and individual performance throughout the entire summer session program. Group sessions vary in size from groups of 180 persons, intermediate groups of thirty, and small groups of twelve or six. As many as thirty-two modern air-conditioned rooms are in use for one class at the same time. The instruction in the summer session classes is designed so that those enrolled experience learning from both a student's and teacher's point of view. The enrollees take tests and discuss the results. They also review test scores of fellow enrollees. They perform tasks such as presenting a one-hour practice lesson and are critiqued; then they critique the presentation of another enrollee who performs a similar task. They are taught to think on an analysis level so that they can analyze what they will teach. They do this by developing measurable teaching objectives and by identifying pertinent instructional activities that provide for student feedback and thus identify learning. This activity leads to development of instructional packages that contain concise statements of material that will be presented and activities that will provide feedback to the teacher. In addition, these packages contain instructional materials for both the student and the teacher. Through the use of examination analysis sheets, the summer session enrollees develop skills that ensure they test on what they taught and at the same time, develop questions that discriminate between the good and poor students.

Many other activities are included in the summer session program. Those enrolled learn how to prepare programmed instruction. They develop skills for maintaining currency of their instructional programs with the occupation for which they are preparing the student. They also develop an overall understanding of and philosophy for vocational education.

Electives

Ten units of elective work required by the credential regulations are mapped out cooperatively by the teacher education office, the school administrator responsible for supervising the teacher, and the individual teacher. The teacher educators identify areas in which teachers may need help. These areas are designated as technical subject content, oral and written communications, professional preparation, and professional education courses. A letter sent to the school administrator indicates the areas in which it appears the teacher needs assistance. The administrator then makes his recommendations and the teacher educator selects a tentative program for the trade-technical teacher. Through discussion with the teacher, a final program aimed at the full development of the trade-technical teacher is established.

Enrollment in these courses may be at the state colleges, the universities of the state, or through university extension. The courses are not offered through the trade-technical teacher education offices.

In-Service Programs

Continuous in-service programs keep instructors abreast of the rapid technological changes in their occupations. These workshop programs vary in length from one day to an entire summer. Various combinations have been employed in the operation of the workshops, from work experience to lectures. Through the in-service program, instructors are provided not only with information and experiences in the technical portions of their subject, but also with experiences leading to the updating of their instruction. Workshops have been offered for teachers in such varied fields as automatic controls, auto mechanics, carpentry, cosmetology, dental assisting, electricity, electronics, lathing, and numerical control.

Plans for the Future

Those working in a dynamic trade-technical teacher education program must adhere to the old adage that says, "Nothing ventured, nothing gained." An ever evolving program is characterized by continual planning and by evaluation of results.

With the advent of newly appropriated federal financial support for vocational education, new programs are being provided in public schools at an increasing rate. New teachers, supervisors, and administrators are being required to staff the new programs. Methods of accommodating larger groups of beginning teachers are continually being studied and evaluated. Greater emphasis is being placed on the preparation of supervisory and administrative staff. Cooperative efforts are being studied to help new supervisors lead their new teachers in improving their instruction and maintaining their currency with occupations and skills.

Plans for the future indicate a program operating in select geographic areas throughout the state under the control of the trade-technical teacher educators at the university. These satellite programs will utilize home study assignments incorporating film strips, workbooks, and programmed instruction. There will be planned discussion sessions where the learning from the home study efforts will be tested and further amplified. These discussion sessions will introduce and develop other pertinent teacher education learnings. In addition, teachers will present three one-hour lessons in their own classrooms at which time, closely sequenced slides of their activities will be made. The method used for the slide presentations will be an improved version of the experiment now going on at a selected junior college. There will also be combined total group meetings at the university.

A program for the development of supervisors for trade-technical education is also evolving. This program will use both formal instruction and internship assignments for field work experience. An experimental program is now in operation and is being tested to see how well formal instruction and field work experiences can best be coordinated. Those participating in this program are involved with instructional supervision and activities related to maintaining currency of their curriculum with occupational needs. They are required to use existing information gathered from the occupational community in which is located the school at which they are serving their internships. It is planned that the activities experienced in this program will facilitate the transition from classroom teaching to effective supervision with relative ease.

These are some of the plans for the future. However, these plans are subject to change as we continue to develop our trade-technical teacher education program in California. It is through a continual effort toward excellence in trade-technical teacher education that an ever adaptable program must be directed.

A PROPOSAL FOR PRE-SERVICE TRAINING FOR TEACHERS OF VOCATIONAL INDUSTRIAL AND TECHNICAL EDUCATION

by

L. C. McDowell*

The only aspect of agreement among the states on teacher education for vocational industrial teachers is disagreement. This can be considered confusion to the extent that the problem is understood--if confusion doesn't exist in this matter, the problem is not understood. Search is continuous for ways of obtaining teachers of trade and technical subjects who will achieve the highest degree of success in occupational teaching. Some states require pre-service training before their teachers are permitted to teach--others do not. Some require, at least, a high school diploma--some do not. Work experience requirements probably would vary from one to ten years.

Apparently, the problem that confronts all states is the staffing of shops and laboratories with teachers who possess, what seem to be, incompatible qualifications--that is, people who have occupational competency and, at the same time, have academic respectability coupled with professional preparation. In most states, it's a rare teacher who is a journeyman machinist, a college graduate, and a professionally trained teacher.

To obtain teachers for the thousands who now await the services of vocational education, compromises are made that will enable the most likely successful individual to step into the teaching position. It is these compromises that bring about the myriad of qualifications which the various states require for teacher certification. It is a very likely truth that no state is satisfied with its requirements for vocational industrial education teachers.

Kentucky has attacked this mounting problem of staffing through sheer necessity. As in most periods of dire circumstances, unorthodox decisions are made in an effort to solve immediate problems. The problem with which this state is immediately faced is the staffing of twenty new area schools (extension centers from its current system of area schools) and expansion of ten of its thirteen present area schools. This $17,500,000 expansion program will require an additional 300-350 teachers within the next two years. While this may not seem an extremely large increase in some states, for the Bluegrass State, the need has caused no little concern. The need is not only for more teachers but effective teachers.

Foreseeing this need, vocational education administrators in the Commonwealth appointed a committee to study the problem and make recommendations which it believed would not only help solve the forthcoming problem but upgrade those presently teaching. The committee, consisting of persons from an area vocational school, teacher education, Division of Teacher

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Certification in the State Department of Education, and a dean from a state university spent many hours in producing what it considered to be a glimmer of light. Another working committee was appointed to enlarge upon the general idea which originated in the first committee.

The working committee was composed of representatives of four of the state universities, a director of an area vocational school, and a trade and industrial teacher educator. This group brought forth a proposal that would provide an associate degree and a baccalaureate degree in vocational industrial education. Specifically, answers to three problems were being sought.

1. How can a person who has a limited degree of occupational competency best be prepared for teaching?

2. What practical method can be used to upgrade present teachers in both academic and technical areas?

3. How can an individual with no occupational competency best be prepared for teaching?

The first two questions were to be answered by an associate degree program while the third question would necessitate a baccalaureate program.

Surely there is nothing unique about degree programs in vocational industrial education. However, such programs for industrial arts departments are probably not carried on in too many states. Maybe a more valid statement would be that they will be headed by people who qualify as T. and I. teacher educators in industrial arts teacher education institutions which use certain industrial arts courses that are applicable to the needs of T. and I. teachers. Practical work experience, as a requisite for successful T. and I. teaching, has not been overlooked in the plan.

It is probable that the proposed training program would encounter too many difficulties to be successful in some states. Certain requisites must be present if success is to be achieved. Some of these necessary conditions would be: harmony between persons in industrial arts and vocational industrial education; mutual understanding of the objectives and philosophy of vocational education; adequate facilities in the industrial arts teacher training institution; a strong teaching staff in the industrial arts programs; a qualified T. and I. teacher educator assigned to the program who will be responsible for coordination of the program with various industries and who will be involved in the teaching of professional teacher education courses; and freedom for this individual to carry out the duties for which he is responsible. Certainly, the administrative personnel at the industrial arts teacher education institutions must be receptive to providing such programs.

Vocational education administrators in Kentucky firmly believe that the use of certain aspects of industrial arts teacher education programs will produce a good T. and I. teacher--one who has a potentiality for growth, not only for teaching, but for supervision and administration. Persons in positions of vocational education leadership must consider the long-run effects of its teacher education programs as well as provide for immediate teaching needs. The plan which Kentucky is proposing to launch will do much to meet these more remote requirements.

The Associate Degree Program.--Persons who will be admitted to this curriculum will be those who have already achieved a degree of occupational competence in the occupation which they propose to teach. They may be graduates of two-year post-high school vocational programs; veterans who have technical training and experience in the armed forces; or they may have acquired occupational competence through practical work experience. In any event, they will not be beginners in their proposed teaching major.

The curriculum consists of the following courses:

Course	Semester Hours
English and/or Communication	6
Science and/or Mathematics	8
Social Science and/or Humanities	6
Psychology	3
Professional Industrial Education (including student teaching) 4 semester hours, Student Teaching 3 semester hours, Methods in Industrial Education 2 semester hours, Principles of Trade and Industrial Teaching 2 semester hours, Occupational Analysis 2 semester hours, Instructional Materials	13
Technical Education (9 hours maximum permitted through proficiency examination)	18
Electives with approval of advisor (3 hours may be given for supervised work experience	10
Total	64

A graduate of the associate degree program must have a minimum of three years of approved occupational experience in the occupation which he plans to teach (present certification requirements in Kentucky) or a minimum of 1400 clock hours of planned and supervised occupational experience in the occupation which he plans to teach. This experience (completed during summer months or by some other prearranged schedule) will be coordinated by the approved T. and I. teacher educator located in the industrial arts teacher education institution.

Student teaching will be done in the student's chosen occupation and will be performed in one of the state's approved area vocational schools under an approved cooperating shop teacher. The supervising teacher from the university in which the student teacher is enrolled will be a qualified vocational industrial teacher educator and will teach the professional methods course (or courses) in industrial education.

The Baccalaureate Degree Program.--For the person who has no occupational competency, a four-year degree program is being undertaken. This curriculum will consist of the same kinds of courses as those included in the associate degree program except for the fact that, being more in number, the student would get greater depth.

The forty-eight semester hour block in the area which he plans to teach would not be a proliferation of courses but would be in work pointed directly at his occupational competency needs. The possibility exists that the student may enroll in technical courses outside his institution in order to satisfy part of this requirement.

The baccalaureate curriculum would consist of the following courses:

Course	Semester Hours
English and/or Communications	12
Science and/or Mathematics	12
Social Science	12
Psychology (General Psychology--3) (Industrial Psychology--3)	6
Professional-Industrial Education (including 8 hours student teaching) Methods in Industrial Education Principles of Trade and Industrial Teaching Trade and Job Analysis Instructional Materials	18
Technical-Industrial Education (laboratory courses in the area in which the individual proposes to teach) (18 semester hours maximum may be allowed by proficiency examination; 6 semester hours maximum may be allowed for supervised work experience)	48

Course	Semester Hours
Health and Physical Education	3
Humanities	6
Elective	11
Total	128

A graduate of this curriculum will be required to have a minimum of 2000 hours of planned and coordinated practical work experience in the occupation which he plans to teach. This requirement will be satisfied by work during the summer months (between regular semesters) and the summer following completion of the student's course work.

As in the associate degree curriculum, student teaching (consisting of eight semester hours and included in the professional education block) will be done in the occupation which the individual plans to teach, in an approved state area vocational school, and under an approved cooperating shop teacher. Likewise, the supervising teacher from the university in which the student teacher is enrolled will be a qualified vocational industrial teacher educator and will teach the professional methods course (or courses) in industrial education.

For the person who has received the associate degree in this area and then wishes to complete requirements for the baccalaureate degree, he may do so by applying his associate degree hours to his baccalaureate requirements. Thus, it is hoped that the baccalaureate degree program will not appear so formidable once the associate degree has been attained.

The committee which has proposed this plan for pre-service teacher education foresees many problems that will need answers before the plan can achieve its optimum fulfillment. However, the problems are not insurmountable. There must be coordination among the four regional universities that will be implementing the plan and current teacher education activities being carried on at the University of Kentucky; there should be similar content in professional teacher education courses; occupational proficiency examinations will need to be provided for giving credit for certain courses; a planned program of teacher recruitment will need to be inaugurated; contacts will need to be established with various industrial concerns for practical work experience for enrollees in the program, etc.

In helping the committee make its decisions relative to the plausibility of using aspects of industrial arts teacher education, a survey was made of existing vocational education personnel in the Commonwealth. It was found that of those holding degrees, 38 percent were industrial arts degrees; seven of the thirteen area vocational school directors were graduates in industrial arts, as were three of the four T. and I. teacher educators, two of the assistant state supervisors in industrial vocational education, and the State Supervisor of Trade and Industrial Education.

It was concluded that if there were any success or merit in vocational industrial education in Kentucky, then surely some of it can be traced to some facets of industrial arts. It must be added, however, that all of these people had trade experience. (It is very likely that industrial arts backgrounds are characteristic of the backgrounds of many persons in vocational education in the various states.)

Kentucky will continue to recruit teachers from industry as well as continue its traditional program of teacher education for these people. To discard this practice would be folly as many excellent teachers have been developed through this method. Additionally, for many trade teachers (chefs, cosmetologists, watch makers, business and office machine repairmen, etc.), the new plan for pre-service teacher education would probably never be feasible.

In the near future, all teachers in the state will need to make satisfactory scores on occupational proficiency examinations (informational and performance) before certification is granted. If it can be shown that teachers of various occupations may receive training through institutional means that will enable them to attain occupational competency as shown by valid examination, it is felt that a great step will be made in dispelling the traditional debate of how much trade experience is required before an individual is considered qualified, occupationally.

The enactment of this proposal should do much to upgrade present teaching staffs, both in academic and technical competencies. Many of those currently teaching have completed their requirements in professional teacher education courses (24 semester hours) and hesitate to continue in other study. The associate degree (as well as the baccalaureate degree) would allow credit for this work already completed as well as make it possible for the individual to be given credit for a portion of the technical course requirements. These allowances should permit the present teacher to readily see that the attainment of an associate degree is not a possibility so remote as to be impossible. In addition to academic and technical upgrading, which should result in teaching efficiency, he would receive a feeling of academic respectability which, very likely, some may not possess.

There is an awareness that many problems will arise which are not now seen. However, most plans will succeed when those involved want them to succeed, and the desire for success for the plan just presented is such that little doubt remains as to its ultimate outcome.

THE UNIVERSITY OF TENNESSEE
VOCATIONAL-TECHNICAL
INDUSTRIAL
TEACHER TRAINING INSTITUTE

by

Joe L. Reed*

The Project

In an effort to meet the demand for an increasing number of up-to-date industrial vocational technical teachers, the University of Tennessee proposed to join hands with industry in a joint use of educational and industrial facilities to meet this need.

Joint Sponsorship

The Institute is a summer program undertaken jointly by the University of Tennessee, Oak Ridge Associated Universities, and the Oak Ridge Y-12 Plant. The University of Tennessee is the official state university and federal land-grant institution of the State of Tennessee. The University's Industrial Education Department of the College of Education has been designated by the Tennessee State Department of Education and approved as the teacher training institution for industrial-vocational education. For many years this institution has conducted educational programs leading to bachelor's and master's degrees in industrial education.

Oak Ridge Associated Universities (ORAU) is a nonprofit corporation of forty southern universities engaged in widely diversified programs relating to education, training, and research. Major programs have been conducted under contract with the U.S. Atomic Energy Commission, National Aeronautics and Space Administration, National Science Foundation, National Institutes of Health, and the U.S. Department of Labor. ORAU will coordinate the experimentation and research activities associated with the Industrial Teacher Training Institute.

The Oak Ridge Y-12 Plant is a government-owned facility operated by Union Carbide Corporation, Nuclear Division, and has approximately 4400 employees. Y-12, one of the largest and most versatile of the U.S. Atomic Energy Commission's facilities, carries out production and development programs vital to the nation's nuclear energy and space programs. Y-12 will provide the physical facilities and instruction for the technical content for the industrial teacher training institute.

Location

The main campus of the University of Tennessee is located in Knoxville, approximate population 200,000. Airline, bus, and railroad services in addition to highways connect Knoxville to all points of the South. Oak Ridge, population about 30,000, is located twenty miles from Knoxville, and is easily accessible to the University campus.

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Y-12 Facilities

The Y-12 Plant is located on a 500-acre tract near the center of the Oak Ridge area. The plant has in operation over 1000 machine tools located in various shops. Many shops provide humidity and temperature controls, while others also meet exacting cleanliness standards.

Staff

UT will furnish administrative, teaching, and guidance personnel for the teacher-education courses as well as joint supervision for all college credit courses. The Y-12 Plant will provide an experienced training staff composed of engineers, scientists, industrial supervisors, and skilled craftsmen for the shop, laboratory, and related technology courses.

Admission Requirements

Instructors and prospective instructors in technical institutes, junior colleges, and area vocational technical schools, including those teaching apprentice and trade extension classes, as well as high school instructors of industrial vocational subjects, will be considered for admission.

These instructors must be presently certified or eligible for certification in their technical field upon completion of this summer program. The applicant will be recommended by the State Supervisor of the technical area in which he is to teach.

This is an Equal Educational Opportunity Program. It is open to all qualified persons without regard to race, creed, color, or national origin.

Application and Registration

Registration and all courses will be provided at Oak Ridge. Tuition and fees will be waived for all enrollees.

Applications will be distributed to teachers through the various Vocational Divisions of the State Departments of Education with a request that they recommend at least six instructors with two each from each of the three areas in which training is to be given.

The ten participating states in the project are Kentucky, West Virginia, Virginia, North and South Carolina, Florida, Georgia, Alabama, Mississippi and Tennessee.

A screening committee composed of representatives from the State Department of Education of Tennessee, The University of Tennessee, ORAU and Y-12 Plant of Union Carbide Corporation, Nuclear Division, will screen the applicants.

Selected instructors will be notified by telegram with a request that they respond by return wire.

UT Courses and Credit

Teachers who satisfactorily complete this summer program will be eligible for 12 quarter hours of college graduate or undergraduate credit which are transferable through the courses that have been scheduled for this project.

The program will encompass three occupational areas:

1. Mechanical Technology and Drafting--including machine and tool design, physical testing, and part programming.
2. Industrial Electronics Technology and Maintenance--including instruments, numerical control, calibration, and printed circuits.
3. Machine Shop and Fabrication--including machining, inspection, numerical control, welding and maintenance.

During the school day, each enrollee will spend two hours in methodology courses, one hour in seminar, and three and one-half hours in shop and related courses in theory and technology. In addition, one period for independent study will be provided.

Financial Assistance

Each enrolled participant will be paid a subsistance allowance of $75 per week. Consideration also will be given to an additional allowance for dependents.

Housing

A large number of furnished and unfurnished apartments, dormitories, rooms and houses are available in Oak Ridge. Apartment rentals range from less than $50 per month upward, depending upon individual preference.

Extra-Curricular Activities

East Tennessee is noted for its many beautiful lakes, rivers, and mountains. Fishing, boating, and swimming are favorite pastimes. The Great Smoky Mountains National Park, sixty miles from Oak Ridge, offers excellent opportunities for camping, hiking, or picnicking. Golf courses, tennis courts, ball fields, bowling lanes, library facilities, and Oak Ridge's large municipal swimming pool provide ample opportunities for varied recreational activities.

Scope of The Program

The teacher training experimental demonstration will be conducted in three cycles. The first cycle will be summer vocational-technical industrial teacher training institute, July 27 - August 26, 1966. Sixty teachers will participate in this institute.

The second cycle will be conducted during the 1966-67 and 1967-68 school years for thirty prospective vocational-technical instructors who will be given technical trade training at the Oak Ridge Y-12 Plant as well as regular general education and teacher training on the campus.

The plan is to select individuals with sufficient industrial and educational backgrounds that will enable them to complete a bachelor's or master's degree in two years and at the same time acquire enough additional trade training in the Y-12 Plant to meet vocational certification requirements for teaching.

The third cycle of the program consists of a second summer industrial institute for one hundred certified instructors from ten southeastern states. They will be selected for training in areas where vocational-technical instructors are needed most.

Unique Features of The Program

This program is innovative and unique in many ways, in that it combines the use of facilities and personnel of industry and education in teacher training. At the same time it embodies some of the basic philosophy of vocational industrial education that has served as guides down through the years of its growth and existence.

It contains bona fide up-to-date technical trade training in an industrial atmosphere on the latest types of equipment and materials. At the same time it contains contemporary methodology for teaching. It will provide opportunity for updating in both teaching content and teaching techniques.

Probably the most unique feature of the project is that the University of Tennessee, which is one of the leading universities of the nation, recognizes the urgent need for vocational-technical teachers and is willing to conduct a program and give graduate and undergraduate credit for all phases of the program in the training of these teachers.

It is planned and hoped that this experimental research demonstration project will develop into a permanent program for the training of much needed teachers in all types of industrial vocational-technical education.

TRADE AND INDUSTRIAL TEACHER EDUCATION IN OHIO

by

Robert M. Reese*

It is evident that the committee wishes to become acquainted with the various types of teacher training used today in the various states. I would like at this time to explain Ohio's program. First, however, I would like to present a brief history of what was found when I returned to Ohio as State Supervisor of Trade and Industrial Education in 1945.

Ohio had been using a system dependent upon six required courses which had been in existence since 1918. These were: 1) trade analysis; 2) course outline writing; 3) instruction sheet writing; 4) shop organization and management; 5) conference method of teaching; and 6) tests and measurements.

I have become satisfied in my own mind that when these six courses were originally organized, they could be offered in proper sequence to the large numbers of teachers who were coming out of industry. Teacher educators had an important task to perform, and no doubt they could provide a reasonable program for the beginning teacher by means of these courses. I shall never forget, however, as long as I live, walking into a situation in which one of our teacher trainers was meeting with a class composed of teachers ranging from first year beginners to those with eight years or more of teaching experience. The majority of the teachers in this center needed the course, "tests and measurements," or number six, so we found two new instructors, one in machine trades and one in welding, sitting in that room listening to a lecture on tests and measurements. It so happened that on this particular evening the presentation was on standard deviation. These new teachers had absolutely no idea of what was going on. Neither did the class. But the element that really caused me to hit the ceiling was that the teacher educator used data from a series of English tests to show them how to compute standard deviation. This was one of the situations when we first felt a change was needed in the teacher training plan.

The second activity which strengthened this decision occurred when the Assistant State Supervisor and I took time to visit every program in the state. Among others, the two key questions asked of every teacher in the state of Ohio was, "What did you get out of your teacher training?" It was extremely embarrassing, especially if one were to add up the funds that Ohio had spent over the years for teacher education, not to have at least one teacher say, "I took it because it would improve my teaching ability." Every teacher stated he took teacher training because certification required it. It is easy to understand this because they were taking courses that weren't appropriate to the individual needs of the teacher.

To make a long story short, we immediately brought our teacher training staff together to discuss the problem. One of our teacher educators was asked to take on the task of analyzing a vocational teacher's job, both the shop and the related instruction.

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After a series of meetings with our teacher training staff, it was determined that we needed the help of our cooperating college deans if any proposed change could be implemented. Therefore, the deans of the three cooperating colleges which were providing teacher training at that time were brought together. The nature of the average Trade and Industrial teacher and the problem of developing skillful teachers from occupationally competent mature individuals was presented, and we asked their help in developing a practical yet effective teacher education program. Our task was very specific, namely to develop teachers who could prepare students to become employable and able to advance in their chosen occupations. Interestingly enough, these deans proposed almost the same program we have had since 1947. The end result of all this effort was that we changed almost completely from collegiate courses to study units and in-service teacher training. We subdivided the usual course content into units which could be assigned the teacher on the basis of his individual need. The next question was how could we give college credit for this type of teacher training work. It was found, however, that since the college deans helped develop the plan, they were willing to be flexible in terms of college credit for work completed.

The only justification that exists for teacher education service is its ability to improve the quality of instruction in trade and industrial programs, and to prepare, through pre-service and in-service training, effective teachers. We have found that the problems of a beginning teacher are not limited to the content of any one particular organized course, but they may involve content from several. Thus, if one had a number of five, ten, or fifteen hour units covering specific problems, it would help him work with the teacher in terms of his particular weaknesses and teach him how to handle a particular teaching situation. As teacher educators, we should be able to help the teacher with the problems he has at any particular time.

You can observe, therefore, that the next step was to bring our teacher education staff together again, report the results of the deans' conference, and plan for implementing a new approach to teacher education. The entire staff went to work, first to develop the details of the overall plan, and second to prepare the instructional materials in unit or study guide form.

Ohio has a program of temporary certification which really means a trial period for both the school and the teacher. When a tradesman comes in, we want to see if he really likes teaching and if he can teach. Local school authorities do their best to carefully select good personnel, then start them off the first year with a temporary vocational certificate. Each new teacher then attends a one-week, pre-service workshop before his school starts. This is a basic orientation program concerned mainly with how to: a) plan and teach a lesson; b) use the four step method of teaching; c) get and hold student interest; and d) manage classrooms and shops. In addition to the pre-service workshop, our teacher educators work with each teacher one half-day every two weeks on an in-service program. The year's activity credits the teacher with fifty clock-hours which will renew his temporary certificate. This plan is used for four years or a total of 200 clock-hours. At this point, the teacher receives a four-year provisional certificate which in Ohio is similar to that received by any other teacher with a degree. To move from the four-year provisional certificate to an eight year professional certificate requires eighteen additional semester hours--half of it in vocational education and half of it outside. We hope that each teacher may obtain enough college credit hours so that he will be encouraged to work on a degree. All of our universities also provide credit for occupational proficiency.

This explains how our certification pattern works and has worked since 1947 with very few adjustments. We have had a great deal of favorable comment from administrators, principals, and from teachers on our present system. I suppose we still have a few teachers who say, "I take teacher training for certification." But gentlemen, there is not one teacher who hesitates to call his teacher educator if he has a question because he feels he can depend on help from his relationship with a master teacher--his teacher educator.

Within the first two years of in-service work, teacher trainees' time is divided between observation, conference, and assignment. After the first two years, due to the expansion in the number of teachers, we have had to alternate between the individualized approach (observation, conference, and assignment) and the seminar approach on a monthly basis. In this plan, teachers travel to a central location where a seminar on teaching problems and techniques are held. All of the technical and practical nurse teachers are handled on the seminar approach. Most of these come to us with some professional background which may range from two years of college to Masters' degrees, and even in some cases, Ph.D. degrees. These teachers must take teacher training, but only for two years.

In previous years, we might have up to twenty new teachers a year. Four years ago, for example, we had about 400 full-time vocational teachers. Now we have 715. Next year we may have as many as 200 more, so you can see the teacher training problem that exists.

We have one more useful item in which you may be interested, that was developed to help plan each teacher's program. It is called the Vocational Instruction Analysis Chart and is used at the end of each school year. The teacher trainer, the teacher, and his immediate superior, whether it be high school principal or local supervisor, take time to review the teacher's strengths and weaknesses by using the items on this analysis chart.

For 1966 we have developed a new teacher education three-ring notebook so that each beginning teacher can keep his teacher education work organized and available for use by the teacher educator, at least until he obtains his four-year certificate.

That's the Ohio story. We are confident that the evidence supports the fact that this system helps the occupationally competent person become a successful teacher. We hold to the philosophy that the responsibility for each teacher's advancement is the responsibility of the local supervisor. Some of them accept the responsibility--some do not. Regardless of whether or not the local supervisor accepts his responsibility, the task of the teacher education program is to develop each person with whom we work into the best possible teacher.

PART IV

PROJECTIONS

PROJECTIONS FOR TRADE AND INDUSTRIAL TEACHER EDUCATION

by

Melvin L. Barlow*

Thinking about the future has always held a fascination for man. He is intrigued with the opportunity to imagine what things will be like in the years ahead. He wants to know so he can plan and be ready for the challenges and rewards held in trust for his arrival on that distant date. The future portends a better day. The drive to look into the future must be related somewhat to the drive to see what is on the other side of the hill--it is part and parcel of man's adventurous nature.

We have had the future out in front of us for a long time. The hours, days, months, and years roll by now much as they always have--but it is different somehow. There is an air of acceleration around us. We are a mite uncomfortable in the new pace. A truth discovered at sunrise may be discredited by nightfall. A five-year plan needs revision in six months. We are reminded continuously of the new dimensions in our everyday life from science and technology. It was about thirty years ago that my physics professor wrote some equations on the board and told us how man could escape the earth's gravitational effect and sail off into space. He made a flat statement that during his lifetime someone would go to the moon. We listened sceptically, but it looks as if his prediction will come true.

Some predictions have not fared so well. The world did not turn out to be flat; the automobile did replace the horse; and Bishop Wright, who claimed that man could never fly, had trouble in his own household. His sons, Orville and Wilber, put little stock in their father's prediction.

So, now, trade and industrial teacher educators want to look into the future and make some predictions. Why? Probably there is an element of that irresistible force of adventure, but it is quite possible that they see also a golden opportunity to junk a few white elephants. What better excuse could one have than to be driven by the panic of technology and the pressure of change, to walk away from a tiresome, dreary routine, and into a new day. This is our opportunity to make our own mistakes, which is a much greater challenge than living with the mistakes of others. But probably most important it is simply inventory time again. The items that sold well will be reordered but with a ribbon tied on as an extra. We will provide room for a little expansion. We will set some items in reserve--now and then a customer really wants an oil lamp--and some of the general merchandise will be swept up and tossed out.

In order to be reasonably safe in our projections we must line up the milestones of the past with an assessment of the present. Through these points we draw a straight line. At some future point we could determine where we would be on this straight line projection. But we must add an "ignorance factor" and move our projected point above the

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straight line because the tempo of the times dictates that our progress is non-linear.

The Past Is Prologue

The vocational education movement is based on a foundation of teacher education. It was intended to be the "quality control" for vocational education. The idea that the program could be no better than its teachers was a fundamental motivating force during the formative years of the vocational education movement. Because of the special work experience requirements upon trade and industrial teachers, it was believed that ordinary teacher education procedures (the Normal School in this case) was not satisfactory, and that special preparation was required. Committees of the National Society for the Promotion of Industrial Education studied the problem of teacher education thoroughly during the years 1912-13. They gave attention to standards, certification, and examinations. The Society's Bulletin No. 19, (1914) established the framework for teacher education and was the strong influence in establishing trade and industrial teacher education in the states after the Smith-Hughes Act was passed.

The task was to establish unity in the matter of teacher education but without control. During the early years, the Federal Board for Vocational Education stressed repeatedly that: (1) the trade teacher must know his trade; (2) he must know how to teach; and (3) the states should not consider the problem of teacher education lightly. Because there were no strict detailed item-by-item, hour-by-hour, directions, we developed 48 different approaches to teacher education. This was perfectly acceptable because it protected the right of the states to be different, which is a fundamental American democratic ideal. The NSPIE and the Federal Board were concerned only that the states didn't adopt some "wild scheme" that did not actually train the teachers.

By and large the early teacher education programs consisted of some kind of (1) craft or trade analysis, (2) methods of teaching, (3) class management, (4) theory and history of vocational education, and (5) supplemental subjects. Some states managed as much as 200 clock hours of instruction conducted during the summer, or spread out over a school year, or both. Innovations popped up all over--the work of James McKinney in Illinois, J. C. Spofford in New Jersey, the Regents of the State of New York, and others. The idea of using occupational tests in trade and industrial teacher selection developed in the spring of 1919.

Bulletins issued by the Federal Board and by the NSPIE (NSVE, 1918-1924; AVA after 1925), brought ideas to the states about the content and direction of teacher education. A few national conferences were held to promote interest and concern for teacher education and to exchange ideas about method and content. There was no question whatsoever but that the Federal Board desired a "super teacher" of many talents.

Before leaving this brief look into the past, it may be valuable for us to recall the attitudes of NSPIE (NSPIE, Bulletin 19, 1914, pp. 23-24) about the topic of "Who is going to teach the teachers?" This was a matter of great concern to the early leaders. As you read the following quotation remember that it was written more than a half-century ago and that we are today thinking about the problem of "projections into the future."

> The leader for the teacher's training class should be a man who brings to the work more than a knowledge of general psychology and the established teaching methods of traditional schools. He should have first hand and thoroughgoing knowledge of the social, economic, industrial and educational problems of the industrial and trade school; he should be thoroughly familiar with its methods of organization and administration and with its teaching practice. A fair measure of the special equipment which such a leader must have in order to conduct successfully such a training course for prospective teachers would be his ability to serve as an acceptable leader in the practical discussion of their problems before a training class for the teachers of an industrial or trade school already in service. A glance at the suggested contents of the course of training which is later recommended as indicative of the kind of preparation for teaching which the student qualifying for service in industrial and trade schools must have, will show at once that the requirements for the leader of the training class as outlined above are certainly none too great and probably entirely too meagre.
>
> No one can successfully induct others into experience he has never had himself. It is obvious that only those who have themselves served as teachers or directors of such schools would be able to measure up to the standard. The few rare leaders of this kind who are available for training purposes are not sufficient to meet the present need and demand rapidly coming upon us. This will make it necessary to employ, to a considerable extent at least, as such leaders, those who have added to all other necessary qualifications for the task, an intimate familiarity, through close contact with the practice and the problems of the schools for which they undertake to prepare teachers.

There could be no question about the importance of selecting the right kind of teacher educator--the "cut of his jib" was designed from the beginning.

Contemporary Issues and Trends

That trade and industrial teacher educators must be influenced by contemporary environment is obvious. That the contemporary environment is expanding and changing at the same time forces the teacher educator into becoming much better acquainted with the nature of this expanding, changing environment. The ability of the teacher educator to adapt to conditions is directly related to his understanding of them. Let's identify some of the factors which projections must take into account.

Labor Force

By 1975 our population of 195 million people will increase to 226 million. Presumably we will need to keep our customary 42 percent of the population at work in order to provide the goods and services required. This means that our labor force will increase from about 78 million now to roughly 94 million in 1975. Obviously the increase will not be uniform in all occupations, and employment of certain age groups will increase more rapidly than others.

Education will be an even more important factor as a determinant of employment. As Grant Venn suggests--education stands squarely between man and his job. Unemployment will continue to fall heaviest upon those with the least education. The motto suggested for the next decade for youth of "Stay in School," appears to be sound.

Details of labor force projections are identified in the publications of the Bureau of Labor Statistics, U. S. Department of Labor, and are likely to continue to represent source data for teacher educators. One thing for certain--work is not going out of style. The recent scare concerning automation is no longer the ominous monster it appeared to be. We can return to our previous pattern of living with it--as in truth we have been doing since man invented the wheel. But there is no doubt about the impact of automation on the labor force; it cannot be ignored.

Economic Growth

Economic growth is comparatively recent in origin. It was only about 200 years ago that the average man began to live above the bare subsistence level. Even more recently we have discovered what a great difference a small change in the rate of economic growth can make. Closing the gap between our actual GNP and our potential GNP has become an item of national policy. Maintaining a high utilization of capacity makes it possible to devote a larger percentage of our GNP into investment, which in time produces capital--the primary ingredient by which technology is translated into production. Because of the recent concern of economists, we have developed much better means of statistical measurements of our growth rate.

The largest single factor to account for our past growth in labor productivity (according to recent studies) is the increased educational level of the labor force. Continuing to improve the educational level of the labor force is essential for economic growth. This accounts in part for the recent support and leadership given to education by the Federal Government.

Sociological Concerns

We are well aware that trade and industrial education has many dimensions--it is a social process, for the purpose of serving a social function. In order to understand the social process involving trade and industrial education we need to know about the nature of the social function it performs. More specifically our concerns are directed toward the role of the teacher in relationship to these social functions.

Sociological data concerning trade and industrial teachers evidently does not exist. A few theses and dissertations have touched the problem tangentially; but, by and large, the "state of the art" appears to be near zero.

Assessment of the situation of sociology and trade and industrial teacher education in the contemporary scene is that this issue has been largely ignored both by the sociologist and the teacher educator. What values might accrue from such studies is purely speculative. However, it does seem reasonable that the social posture of the teacher is important enough to warrant an extensive review. The teacher's efforts bear directly upon the standard of living of a family unit--this in turn has sociological and economic dimensions.

The Educational Mind

The "educational mind" of America has had a permissive attitude about vocational education rather than a wholehearted endorsement. Why this should be true is difficult to understand, particularly in view of the contemporary emphasis upon the role of education in the social and economic development of the nation. The evidence is clear that the people of America are demanding a new role for vocational education.

Let me digress for a moment and report some views that suggest the need for some sweeping changes in educational thought. When the vocational education bill was being discussed in the House of Representatives, Congressman Silvio O. Conte (Massachusetts) spoke about his experience (Congressional Record, 1963, p. 13481) as a student in vocational education classes and cited that this experience was essential to his future success. In the debate in the Senate we see many other examples of broad-gauge views citing intrinsic values in vocational education. Senator Morse (Oregon), Senator Ribicoff (Connecticut), and Senator Clark (Pennsylvania), were quite pointed in their remarks (Congressional Record, 1963, pp. 17842, 17843, 17850) about the values to be obtained from vocational education. We could turn to other sources for additional supporting evidence of the attitude of members of the public at large.

An educational revolution is in the making--well, reorganization and adjustment, at least--in which trade and industrial education emerges in its larger educational significance. This can happen, however, only when the "educational mind" becomes concerned with competencies that are actually achieved rather than with years, semesters, or units of confinement to the study of a particular subject. We know--and this may be largely a feeling rather than a conclusion based on objective evidence--that many trade and industrial classes can teach a great deal of the mathematics, science, social relationships, and other subject matter values needed by the vast majority of the population. It is also a fact, however, that trade and industrial education has done little to provide the evidence that the essence of many of the subject matter values are inherently a part of trade and industrial education. I have long held to the point of view that vocational education can make many of the common learnings of education valuable in the educational experience of many students, but we have been blocked by two forces--(1) the prevailing educational mind, and (2) our own initiative in moving aggressively in this direction.

There Are More Issues

Mindful that many other issues and problems can be shown to be representative of the contemporary scene, we can let the case rest on these four examples. However, two related points deserve attention.

First, a vast amount of research has been conducted on the learning process and the nature of teaching. This resource should not go unnoticed in projections into the future. Much of the research will need adaptation to trade and industrial teacher education, particularly if the research was carried on in another area of education. The principles, however, ought not to change.

Second, in order for trade and industrial teacher educators to reach new achievements in the dynamic future, it is essential that they become more fully aware of the heritage of industrial education--not the factual data alone, but the rationale behind the idea. Teacher educators must become students of the principles of industrial education before they can establish solid foundation materials for the members of their classes.

The Future

It is traditional in predicting the future to point out that the conclusions are based on at least two assumptions: first, that the economy will continue to grow; second, that we will be free from major social upsets. If a war or an economic depression occurs, all bets are off. I don't know why this logical point of view needs to be brought into the discussion, but this much of tradition is safe, at least. Now let's turn our attention to the teacher of trade and industrial education classes.

Occupational Experience for Teachers

It will be a long time before we give up the concept of "occupational experience" as a prime ingredient in the background of trade and industrial teachers. This is a foundation principle of trade and industrial education, and I believe that the idea behind the principle is sound and enduring. Our methods of interpreting the principle will change, and change radically, but the principle itself will be retained.

From the very beginning of trade and industrial education, the ideal teacher has been cast in the role of a master craftsman. Prosser's idea of the master craftsman exceeded by far the achievement of skillful manipulation of tools, equipment, and materials. Prosser's ideal teacher had the ability to adjust to changing environment. He was a self-starter, and he became a lifelong student of the art of teaching. He had "a reach beyond his grasp." He was inventive and creative, and he was well aware of his social obligations to the world of work. These criteria will fit any age.

Our craftsman-teacher of the future will of necessity be a much better scientist than his predecessors. In this there is no choice--we are merely adjusting to the environment, and the environment is definitely scientifically oriented. This point of view does not represent change in the sense that we have abandoned earlier principles. All we are doing is maintaining a relationship to contemporary requirements, but this relationship is never static. Rousseau wanted Emile to become a carpenter, not just an ordinary carpenter but to reach what Rousseau called "the state of a carpenter." I imagine Rousseau had in mind performance which was a "cut above" that which was ordinarily satisfactory. Let us leave this point temporarily and return later; there are unresolved issues that must be faced.

Educational Achievement of Teachers

In 1917 we were quite content with educational achievement at the eighth grade level for trade and industrial teachers. Natural progression has moved the level upward to high school graduation and beyond as a minimum. It is obvious that our trade and industrial teacher of the future will of necessity be required to reach high pre-service educational levels. College degrees for trade teachers? This question no longer has a place in the doubtful area. However, in my own experience, I have been chastised severely by a trade school principal (who had completed an MA degree) for encouraging one of his teachers to continue his work at the college level. The principal held the view that a college degree would ruin the trade teacher. The time is rapidly approaching when differences in educational achievement of trade and industrial teachers, as compared with teachers in general, will be nonexistent. The sooner that time arrives the better. Writers have appraised the present situation as a race between education and catastrophe, and with some feeling that catastrophe has a leading edge. This fits our situation like a hand in a glove--failure on our part to recognize the imperative necessity of boosting educational levels can result in a very difficult situation if not catastrophe.

Finding a Tenable View--Occupational Experience and Educational Achievement

At this point I have cited as imperative in the future a teacher who

- is a master craftsman
- is a scientist
- has an educational achievement parallel with other teachers.

Now, how can we meet the challenge?

The idea is to hang on to the gains we have made and not lose anything in the transition period. To do this requires skillful analysis, imaginative planning, and a creative environment.

As a general rule, we have searched for a potential teacher when we have some assurance that one is needed. We go to the job and find the master craftsman. In California we make him prove his craftsmanship by a performance examination and his understanding of the theoretical side of his occupation by a written examination. Representatives of labor and management assist in the process. But we do this only when teacher needs are present.

Our task in the future is to plan ahead and have available for assignment to trade and industrial instruction a person who matches rather well the ideals previously cited. Let me illustrate this point by reference to only one means of achieving this goal. Obviously there are others.

One of my colleagues has advanced the idea that the "outstanding apprentice" graduate is a prime candidate for trade and industrial teaching. We have largely ignored this suggestion over the years because when we open the office each morning we have a line of people waiting to become teachers.

My colleague points out that some of these outstanding apprentice graduates also receive their AA degrees from the junior college at the same time they are advanced to journeyman status. Why not get a line on them now, put them on the roll as future teachers, follow their progress on the job, urge them to continue their education? At some appropriate place along the line involve them in the "teacher training" requirements for certification. Before you know it you have on hand people who meet the ideal conditions, and they are ready to go to work as teachers.

The point I am making is that it is possible to select teachers, to plan ahead (raise the teacher from a pup, so to speak) and thereby improve the general quality of teachers in trade and industrial education. I am firmly convinced that this is a teacher educator's responsibility and that it is an essential element in the future.

Professional Teacher Training

The National Society for the Promotion of Industrial Education set guide lines for teacher training so that by 1917 states had a pattern to adopt in response to the requirement of the Smith-Hughes Act. The program was sterotyped, mechanical, and routine but better by a long shot than no plan at all. Over the years some focus has been given to improvements and change. Eighteen years ago about twenty teacher educators met in Washington, D.C., to reconsider our progress and to make a revolutionary plan. We exchanged syllabi. Each proved the merits of his own plan, and we came out of the encounter with a highly organized series of packages of material "every teacher needs to know." I am sure this was an improvement. I doubt its value today, and it would be insane to think it had value in the future--the plan ignored completely the "primacy of the person" in teacher education. Trade and Industrial Teacher Educators could profit by an occasional reading of: Keller, F. J., Principles of Vocational Education, Boston: D. C. Heath and Company, 1948. The theme of the book is "the primacy of the person."

Our highly organized content-oriented teacher training program has tended to change--and must change in the future--to a process-oriented program of teacher education. (Note the sophistication, teacher training to teacher education.) The content isn't very important actually. How the teacher educator uses the content with the prospective teacher is important. Teachers in training must become "active participants" rather than "passive learners." The program of teacher education of the future, involving team teaching, programmed learning, large and small group processes, must be directed toward motivation of teachers. The extent to which we can be successful depends entirely upon the creative imagination of teacher educators.

The idea is entirely in keeping with the concepts of flexibility inherent in the evolving program of vocational education. I am positive that the content-oriented program of the past has no place in the future--its values are definitely suspect.

Built into the future we must have a system of sharing of ideas about process in teacher education. Annually--at least bi-annually--national and/or regional meetings of teacher educators must be organized in order that teacher educators may describe and demonstrate the processes they have used. This is the crucible for the generation of new ideas. This is the source of professional growth for teacher educators. The future demands that it not be considered lightly.

(Note: A related problem exists that cannot be delineated in detail here, but it can be acknowledged. Some states, because of size of program alone, will not in the immediate future be able to develop a full-scale professional program of teacher education. They should have an opportunity to share in the teacher education resources of states that do have fully developed programs of teacher education. There is no excuse in the future that can condone poorly prepared teachers any place. Financial resources of the Vocational Education Act of 1963 can be devoted to this problem. The problem can be solved, and it is urgent.)

Part-Time Teachers

Potential growth of the part-time program of trade and industrial education can reach proportions that stagger our imagination. The combined effects of automation, need for retraining, necessity of upgrading and updating, and the emerging patterns of lifelong learning related to occupations, will produce significant increases in the enrollment in the area of the trade-industrial-technical extension program. This means more teachers.

The assumption generally made that this group of teachers has been largely ignored in teacher education does have some foundation. The facts in the case are neither well known nor readily available. Hence, the contemporary status of teacher education for part-time instructors cannot be treated objectively. Nevertheless the future portends that this area be removed from its uncertainty and treated on a professional basis. The idea that occupational competency does not in itself predict teacher competency is evidently sound. However, like the proposals for the future of teacher education for full-time teachers, the part-time teacher education program must be strongly process oriented.

The old idea of assigning the responsibilities of teacher education for part-time teachers to a local coordinator, supervisor, or director, has had its day. Such evidence as I have seen across the nation of the value of teacher education conducted under this arrangement has not led me to believe that it was a howling success. I still believe that supervision is related to improvement of instruction, but I believe that the pre-service phase of teacher education for part-time teachers is the proper province of teacher educators and this will loom large in the future as part of the professional obligation of teacher educators.

The In-Service Teacher Education Problem

We have been successful in ignoring the problem of in-service teacher education but it won't go away. It is a demanding issue in the contemporary scene, an imperative issue in the future.

The problem has two dimensions: (1) knowledge-skill upgrading and updating; and (2) professional upgrading in instructional matters. I doubt that the relationship is 50-50, probably more like 75-25; certainly the evidence suggests an emphasis on the first part.

In the past we have left the matter of keeping up with his occupation entirely up to the teacher. Some pressure was exerted to get him "to return to the trade" for a summer once in three to five years. Many teachers performed this task voluntarily as a means of supplementing teacher salary. Contemporary and future projections suggest that this casual approach is not satisfactory and that some positive action is necessary. I believe that planning, organizing, conducting, and reporting this phase of in-service training is a responsibility of teacher education. Programs such as "cosmetology workshop," "numerical control of machine tools seminar," and similar programs can cater to the technical needs of specific groups of teachers. Programs should tend to be short-unit affairs conducted throughout the year. All programs should be planned with the aid of a representative committee of instructors for whom the program is intended. Preparation should be complete with all kinds of resource material available for the particular subject.

Some part of each program should be devoted to the professional instructional aspects. "How can we teach this new technical content?" is representative of the questions answered in the professional instructional phase.

It is imperative that teacher educators begin immediately to assess the need for such programs in each state. Potentially, every occupational area represented should be provided for. Obviously some occupational areas will have so few instructors that a special program would not be feasible. This brings into view the necessity of regional and national programs. Special workshops or seminars for instructors of "Inhalation Technology" would need to be national in scope. Whereas programs for electronics instructors could assume state or regional dimensions. Knowledge generated, conclusions reached, recommendations made at these meetings should be reported to every teacher of the subject in the United States, and copies lodged with central depositories. Cooperative planning on a national basis should generate a series of in-service programs throughout the United States--some national, some regional, and many state-wide or regional within a state.

This problem is far too complex to work out in detail in this paper. However, in-service teacher education is unquestionably of major proportions in the projections in the future.

Research in Teacher Education

Vocational education has been research-starved for fifty years. The problem is no better in trade and industrial teacher education and is perhaps even more critical. We can almost close our eyes, move in any direction and still be on target as far as research needs are concerned. Independent, uncoordinated research activity in teacher education will compound the chaos long before it will provide significant information of universal value. The need of the future is a program of teacher education research planned so that in total it advances knowledge in areas of significant need. Our research needs occur throughout the entire continuum of research from the immediately useful information to that which cannot be pegged in a time sequence in relation to its practical need.

Some part of the teacher education activity in every institution having responsibility for trade and industrial teacher education must be devoted to research in teacher education in 1966-67 and in the following years. The secret of success is centralized coordination so that we have different projects under study rather than multiple projects on the same topic. Inherent in the process of conducting research in teacher education is the necessity to produce trade and industrial educators who are competent to plan and conduct significant research projects. Although the research responsibility has doctoral and post-doctoral implications, such goals should be only incidental to the task of understanding the teacher and his environment so that teacher educators can become increasingly effective in their relationships with prospective teachers.

Three Issues--Four Responsibilities

A critical review of the projections will cause one to raise a question about the adequacy of the projections in terms of new frontiers and dynamic change. The projections do not show a dramatic burst into a new environment. In no way have the projections been cast into a future role that breaks completely with the past. My justification is based on the conviction that we have developed many facets of teacher education over the years that are sound to the point of resistance to change. The major adjustment appears to be a movement away from being slavishly devoted to a content orientation to an emphasis upon a process orientation. Only in this way can we actually achieve active participation among student teachers.

The three foundation issues that set the stage for trade and industrial teacher education are: (1) occupational experience requirements; (2) educational achievement requirements; and (3) a tenable arrangement of the two. When these issues are resolved into some semblance of stability, teacher educators can pursue their four responsibilities: (1) professional training for full-time teachers; (2) professional training for part-time teachers; (3) in-service training; and (4) research in teacher education.

Within the framework of the three issues and four responsibilities, the projections of trade and industrial teacher education for the future can be located. No attempt has been made to identify purely operational problems because of the transient nature of such problems.

The International View

The International Vocational Training Information and Research Center (CIRF), Geneva, Switzerland, issued a monograph on the training of vocational teachers in September 1964 (CIRF Monographs, 1964. pp. 10-12). The general conclusions provide an opportunity to check agreement and/or differences with the projections proposed above. In order not to distort the stated conclusions I have chosen to quote rather than paraphrase.

It may be said that there is a wide measure of agreement between countries as regards teacher training standards for general education.

There is no such agreement in vocational teacher training practices. The range of existing variations is too wide to be acceptable: recruitment at skilled worker, technician or university levels; one week, four weeks, three months, four years of special training. If vocational training and education, which are catering for more than one-half of all young persons in industrially advanced countries, are to acquire the desirable intellectual standards and social status, then vocational teacher training will have to be developed to ensure that the teachers themselves get the appropriate experience and competence.

Vocational training and education of high standards requires a permanent establishment of highly qualified teachers--teachers with a sound educational background, in close touch with developments in industrial as well as other fields of economic activity.

There is a general awareness of this need; and during the past few years, most countries have made adjustments in their recruitment and training policies for vocational teachers. Some of them are also planning to introduce further reforms. The main impression is therefore one of continuing change.

Do the changes go far enough? Even after recent improvements, many countries do not reach the minimum levels internationally accepted in the 1962 ILO and UNESCO recommendations on the subject . . . . The OECD Seminar in Frankfurt, whose recommendations are given below (not included with this quotation), suggested gradual improvement under a long-term plan of development.

Do all the changes constitute improvements? Many of them have been inspired by the existing acute shortages; they are mere expedients courting the risk of lowering accepted standards.

Are the standards always observed? Opportunities for further training are sometimes nullified by the inability of the schools to release their teachers for any length of time. A disquieting number of vocational schools are operating with teachers whose qualifications do not satisfy the national standards.

Three types of action are needed. The first is relatively short-termed: the gaps in the existing systems of vocational teacher training must be filled.

The second entails a long-term and comprehensive planning with a view to raising the over-all level of vocational training and education.

Thirdly, facilities for further training and updating of knowledge and practical experience must be expanded.

Thus, in the international view, some of the problems and some of the recommended solutions are closely related to our own projections.

Postscript

Trade and industrial education's most formidable opponent is the "educational mind" of America that does not understand the values of trade and industrial education. Maximum progress in the future will be retarded as long as the set of the "educational mind" retains its present characteristics.

Despite this extremely difficult situation, teacher educators can move into the future with increasingly effective programs of process-oriented teacher education for full-time and part-time teachers. A substantial increase in the scope of in-service training must be a supporting adjunct to the basic programs of teacher education. I don't know if the teacher education group is the most important group to be involved in changing the attitudes of American educators--but it is most certainly a critical group. In the long run, what happens in the classroom and the shop, and later on the job, depends greatly upon the teacher. How well the teacher performs his task is a direct reflection of teacher education.

Persons involved directly in the task of teacher education must be in a position to exchange ideas frequently and to brainstorm as a group all facets of teacher education. Every trade and industrial teacher educator in the nation must become intimately acquainted with processes of teacher education wherever it is conducted. The means whereby this can be achieved must be discovered.

Parallel to the actual program of teacher education is the need for a substantial program of research. I do not know what research is under way in trade and industrial teacher education throughout the nation, but I do know that there is little or no coordinated effort. We must begin immediately, through a coordinating group of trade and industrial teacher educators, to assign research projects to every institution maintaining a concern for research and having a teacher education responsibility. Many teacher educators must have a part in the research in teacher education, but the parts must all fit together.

Anyone fortunate enough to be involved in trade and industrial teacher education, and its associated research activity during the next decade, will be fortunate indeed. Without quality of performance in teacher education no other progress is possible.

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PART V

GUIDELINES

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RESEARCH AND DEVELOPMENT SUGGESTIONS

Following the presentations designed to review the research, the professional literature, and the innovative programs and practices, the conference participants directed their attention to the development of guidelines for improving and expanding trade and industrial teacher education. The problem was attacked by first developing a set of principles for sound T. and I. teacher education. The next step was to analyze each of the principles for implications for needed research or action programs.

In approaching the problem in the manner described, it was assumed that the proposed principles would need the support which might be provided by additional research or that the statements would have implications for needed developmental projects.

Admittedly, the participants did not exhaust all possibilities in listing principles of trade and industrial teacher education, and they suggested the statements be further refined. It was their desire to have the proposed principles sent to all T. and I. state supervisors and teacher educators for review and reaction prior to the publication of a monograph devoted solely to this subject. Consequently, the principles will not be incorporated in this report but will appear in a separate publication. Because of the immediate value of the papers presented at the conference, however, it was decided that the publication of this report should not be delayed to incorporate the guidelines. The research and development priorities generated by the conference activity are reported.

Research and Development Priorities*

During the discussion on research and development priorities, twenty-one needs were cited as having high priority. Several participants expressed personal interest in developing projects that might result from the various suggestions which were listed. It was agreed that The Center at The Ohio State University and the appropriate bureaus of the U. S. Office of Education should pursue a follow-up of the conference to encourage implementation of the project suggestions.

Without reference to an order of priority, the research and development suggestions were the following:

1. Identify and evaluate practices of pre-service and in-service trade and industrial teacher education in the nation.
2. Prepare monographs to fill voids in the professional literature for T. and I. teacher education.

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*The Center staff wishes to remind the reader that the research priorities listed are those developed by the conference participants and should not be confused with the priorities established by the U. S. Office of Education or other research sponsoring agencies.

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3. Evaluate the teacher education principles developed during the planning conference.

4. Identify the unique features of T. and I. and technical teacher education and the elements common to all vocational and technical teacher education programs.

5. Conduct a study to establish minimum standards for teacher education for a state.

6. Evaluate micro-teaching for teaching manipulative skills.

7. Determine occupational competencies needed by T. and I. teachers.

8. Determine the kinds of institutes needed to upgrade T. and I. teachers.

9. Study the activities (assignment and actual performance) of T. and I. teacher educators.

10. Determine the needs and present practices of special teachers (MDTA, disadvantaged, etc.) and how to meet these needs.

11. Conduct a comprehensive study of the part-time T. and I. teachers and how their needs are being met.

12. Conduct a study which would demonstrate the value of teacher education.

13. Determine the need for on-the-job training types of teacher education programs.

14. Conduct a national study to assist in projecting the needs for new and replacement T. and I. teachers.

15. Study the profiles of teacher educators to determine what makes a good teacher educator.

16. Investigate the concept of the "good teacher" in T. and I. education.

17. Study the effects of student feedback upon teaching behavior.

18. Evaluate the effectiveness of new educational media which may be used in T. and I. education.

19. Develop a model for each state to use in a system of continual evaluation of the process and product of T. and I. teacher education.

20. Plan and conduct a series of national, regional, and state institutes and workshops for T. and I. teacher educators and supervisors on problems such as teacher recruitment, selection, and training, and the development of research competency.

21. Determine the teacher competencies that should be specified in certification requirements for T. and I. teachers.

Other Center Publications

"Guidelines for State Supervisors in Office Occupations Education." 1965 Business Clinic

A Report of a National Seminar on Agricultural Education, "Program Development and Research."

"Guidance in Vocational Education." - Guidelines for Research and Practice.

"Research Planning in Business and Office Education."

"Evaluation and Program Planning in Agricultural Education."

"A Report of a National Seminar on Health Occupations Education Centers."

"A Report of a National Seminar on Cooperative Education."

A Report of "A National Leadership Seminar on Home Economics Education."